PA501

User's Manual

TRADEMARKS

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About This Manual

The PA501 User's Manual provides instruction for qualified personnel to follow when setting up a new PA501 device.

This document is intended for use by qualified personnel to compliment the training and expertise, not to replace it.

Related Information

Current information and manuals are available for download at the following website:

http://www.ruggon.com

Conventions

Bolded or underlined text is used to emphasize the designated information.

A Note is used to provide additional information for the device or settings.

A Caution is used to warn against potential hazards or to caution against unsafe practices.

A Warning is used to identify immediate hazards for property damage, injury or death.

Basic Safety Guidelines

The following safety guidelines are intended to help protect the user from injury and prevent damage to the hardware.

- Do not place anything on the AC adapters power cable and make sure the cable is not located where it can be tripped over or stepped on.
- Do not cover the AC adaptor as it reduces the cooling.
- Do not use the AC adapter while it is inside the carrying case.
- Use only the AC adapter, power cord, and batteries that are approved for use with the device. Use of another type of battery or AC adapter may cause risk of fire or explosion.
- If you use an extension cable with the AC adapter, ensure that the total ampere rating of all products plugged in to the extension cable does not exceed the ampere rating of the extension cable.
- If the device is moved between environments with very different temperature and/ or humidity ranges, condensation may form on or within the device. Avoid damaging the device by allowing sufficient time for the moisture to evaporate before using the device.
- When disconnecting cables, pull on the connector or on its strain relief loop, not on the cable itself. When pulling out or plugging in the connector, keep it evenly aligned to prevent bending the connector pins.

Intended Use

The PA501 rugged tablet is equipped with multi-functional terminals for stationary and mobile applications in industrial environments such as logistics, warehousing, fleet management, manufacturing and the automotive industry.

Read the safety guidelines thoroughly before starting any servicing on the device. Read the guidelines before powering up the device, and keep this document for later use.

The operator is solely responsible for any damage resulting from unauthorized modifications to the device.

Unintended Application Use

The device is not designed for use in life-support systems or critical safety/security systems where system malfunction can lead to the direct or indirect endangerment of human life. The operator is fully responsible for using the device in these situations.

Maintenance and Operation Overview

The PA501 is designed and manufactured according to strict controls and following the stated safety regulations. The following list identifies incorrect operating uses of the PA501. Incorrect use of the PA501 can lead to hardware damage, safety issues and possible risk to personnel health:

- The PA501 is under operation by untrained personnel;
- The PA501 is not maintained as recommended;
- The PA501 is not used as intended.

Safety

To prevent injury and damage, read the following safety guidelines prior to operating the device. The manufacturer assumes no liability for any and all damages arising from misuse or noncompliance with these guidelines.

Electrical Hazards

Cleaning/Servicing: Power Off the PA501

- Disconnect the PA501 from power before cleaning or servicing it.

Power Adapter

Contact an authorized service personnel for repairs to the power pack. In the event of a blown fuse after replacing the fuse, contact an authorized service personnel to avoid electrical shock.

Use only Supplied Power Cables

RuggON power cables meet industrial requirements for low-temperature flexibility, UV resistance, and oil resistance. Use only supplied power cables from RuggON.

If other power cables are used, the following may apply:

- The operator is solely responsible for the resulting damage;
- All RuggON warranties are void.

Environmental Hazards

Do not use the PA501 in locations near/with flammable gases or vapor. The

use of electrical equipment in explosive environments can be dangerous.

- Turn off the device when near a gas station, fuel depot, chemical plant or a place where blasting operations take place.

Environmental

Ambient Temperature

The PA501 operates on the basis of a fanless concept which internal waste heat is released via the housing surface and requires fresh airflow in the environment.

- Operating the PA501 with no fresh cooling air may cause overheating and damage to the device.
- The operating environment should not be enclosed to prevent the cool air being heated by the heat waste from the device.

Connecting and Disconnecting External Devices

To prevent the considerable damage, the PA501 and the external device should be disconnected from power when connecting/disconnecting excluding USB devices.

Only Use Authorized Accessories

Only use the supplied cables, power packs and other accessories that have been tested and approved by RuggON. Contact your local distributor for further information.

Radio Transmissions

Permitted Transmission Power

Follow the national regulations for the maximum permitted transmission power.

The operator is solely responsible for this type of operation.

Radio Frequency Limited Locations

Considering the radio frequency limitation in hospitals and aircraft, the PA501 can only be installed with permission.

Industrial computers may affect the function of implanted medical devices such as pacemakers and may cause malfunction.

Cleaning and Servicing

- Disconnect the PA501 from power before cleaning or servicing.
- Never clean the PA501 with compressed air, a pressure washer or a vacuum cleaner.
- If necessary, clean the housing of the PA501 with a damp cloth.
- Clean the touch-screen with a nonabrasive cloth.

Regulatory and Certification

Canada

IC No.: 25233-PA501B

Contains IC No.: 25233-MS01PRO

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe B prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

Changes and modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Industry Canada rules.

Les changements et modifications non expressément approuvés par le fabricant ou le détenteur de cet

équipement peuvent annuler votre droit à utiliser cet appareil en vertu des règles d'Industrie Canada.

Antenna Statement

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la

puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Licence exempt

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

this device may not cause interference, and

this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

l'appareil ne doit pas produire de brouillage, et

l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This Class B digital apparatus complies with Canadian ICES- 003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

This Category II radio communication device complies with Industry Canada Standard RSS-310.

Ce dispositif de radiocommunication de catégorie II respecte la norme CNR-310 d’Industrie Canada.

IMPORTANT NOTE: IC Radiation Exposure Statement

This EUT is compliant with SAR for general population/uncontrolled exposure limits in IC RSS-102 and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528. SAR is measured with the device at 0 mm to the extremity, while transmitting at the highest certified output power level in all frequency bands of the device.

This equipment should be installed and operated with a minimum distance of 0 cm between the radiator and your extremity. This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter. The County Code Selection feature is disabled for products marketed in the US/Canada.

IC SAR warning

Radio Frequency (RF) Exposure Information

The radiated output power of the Wireless Device is below the Industry Canada (IC) radio frequency exposure limits. The Wireless Device should be used in such a manner such that the potential for human contact during normal operation is minimized.

This device has been evaluated for and shown compliant with the IC Specific Absorption Rate (“SAR”) limits when installed in specific host products operated in portable exposure conditions.

Informations concernant l'exposition aux fréquences radio (RF)

La puissance de sortie émise par l’appareil de sans fil est inférieure à la limite d'exposition aux fréquences radio d'Industry Canada (IC). Utilisez l’appareil de sans fil de façon à minimiser les contacts humains lors du fonctionnement normal.

Ce périphérique a été évalué et démontré conforme aux limites SAR (Specific Absorption Rate – Taux d'absorption spécifique) d'IC lorsqu'il est installé dans des produits hôtes particuliers qui fonctionnent dans des conditions d'exposition à des appareils portables.

The device could automatically discontinue transmission in case of absence of information to

transmit, or operational failure. Note that this is not intended to prohibit transmission of control or signaling information or the use of repetitive codes where required by the technology.

The device for the band 5150-5250 MHz is only for indoor usage to reduce potential for harmful interference to co- channel mobile satellite systems; the maximum antenna gain permitted (for devices in the bands 5250-5350 MHz and 5470-5725 MHz) to comply with the e.i.r.p. limit; and The maximum antenna gain permitted (for devices in the band 5725-5850 MHz) to comply with the e.i.r.p. limits specified for point-to-point and non-point-to-point operation as appropriate, as stated in section A9.2(3). In addition, High- power radars are allocated as primary users (meaning they have priority) of the band 5250-5350 MHz and this radar could cause interference and/or damage to LE-LAN devices.

FCC

FCC ID: 2ABTU-PA501B
Contains FCC ID:2ABTU-MS01PRO

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio / TV technician for help.

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

This device is operation in 5.15 – 5.25GHz frequency range, then restricted in indoor use only, Outdoor operations in the 5.15 – 5.25GHz is prohibit.

This device is slave equipment; the device is not radar detection and not ad-hoc operation in the DFS band.

Labeling Requirements

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Users are able to access information in a device's settings.

Settings->System->Regulatory information

1. Turn on your device
2. Draw down form top side of device
3. Tap settings icon
4. Slide down and choose system
5. Slide down and choose Regulatory information

RF Exposure Information (SAR)

This device meets the government's requirements for exposure to radio waves. This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission of the U.S. Government.

The exposure standard employs a unit of measurement known as the Specific Absorption Rate, or SAR. The SAR limit set by the FCC is 1.6 W/kg. Tests for SAR are conducted using standard operating positions accepted by the FCC with the EUT transmitting at the specified power level in different channels.

CE Marking

CE

	BE	BG	CZ	DK	DE	EE	IE
	EL	ES	FR	HR	IT	CY	LV
	LT	LU	HU	MT	NL	AT	PL
	PT	RO	SI	SK	FI	SE	UK

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. Please contact your local representative for ordering information.

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

European declaration of conformity

According to ISO / IEC Guide 22 and EN 450 14

Manufacturer's Name: RuggON Corporation

Manufacturer’s Address: 4F, No.298, Yang Guang St., Neihu Dist., Tapipei City, Taiwan
Declares, under our sole responsibility, that the product: Product Name: Rugged Tablet
Model Number: PA501B
Conforms to the following Product Specifications:

- RED 2014/53/EU LVD 2014/35/EU EMC 2014/53/EU RED

- ETSI EN 301 511
- ETSI EN 301 908-1
- ETSI 301 489-1
- ETSI 301 489-52
- ETSI EN 301 489-1
- ETSI EN 301 489-3
- ETSI 300 330
- ETSI EN 303 413
- ETSI EN 301 489-19
- ETSI EN 300 328
- ETSI EN 300 893
- ETSI EN 301 489-17
- EN 55032: 2015+AC: 2016
- EN 55035: 2017
- EN 55024: 2010+A1:2015
- EN 60950-1:2006/A11:2009 /A1:2010/A12:2011/A2:2013

Supplementary information

In addition, the product is battery powered and the power supply provided with this product has been certified to IEC 60950-1: 2005 2nd edition +Am1:2009+Am2: 2013. As manufacturer, we declare under our sole responsibility that the equipment follows the provisions of the Standards stated above.

Importer of Record

CAUTION - Only approved accessories may be used with this equipment. In general, all cables must be high quality, shielded, correctly terminated and normally restricted to two meters in length. Power supplies approved for this product employ special provisions to avoid radio interference and should not be altered or substituted. Unapproved modifications or operations beyond or in conflict with these instructions for use may void authorization by the authorities to operate the equipment.

This RuggOn product has been tested and found to comply with all requirements for CE Marking and sale within the European Economic Area (EEA). The device has Bluetooth and wireless LAN approval and satisfies the requirements for Radio and Telecommunication Terminal Equipment specified by European Council Directive 2014/53/EU. These requirements provide reasonable protection against harmful interference when the equipment is operated appropriately in a residential or commercial environment.

The device is intended for connection to European Networks

a. Caution:

- Risk of explosion if battery replaced by an incorrect type.
- Dispose of used batteries according to the instructions.

b. Make sure the temperature for adapter will not be higher than 40 ˚C.

CE RF Power Table

2.4GHz Maximum Conducted Power													
MIMO A						MIMO B						Avg	Peak
CH.	802.11b Freq.(MHz)	Setting	Avg (dBm)	Peak (dBm)	Power Reduction Reason	CH.	802.11b Freq.(MHz)	Setting	Avg (dBm)	Peak (dBm)	Power Reduction Reason	MIMO A+B (dBm)	MIMO A+B (dBm)
1	2412	14	13.07	15.94		1	2412	14	14.06	16.90		16.60	19.46
7	2442	14	12.95	15.75		7	2442	14	13.81	16.67		16.41	19.24
13	2472	14	13.04	15.71		13	2472	14	13.97	16.85		16.54	19.33
CH.	802.11g Freq.(MHz)	Setting	Avg (dBm)	Peak (dBm)	Power Reduction Reason	CH.	802.11g Freq.(MHz)	Setting	Avg (dBm)	Peak (dBm)	Power Reduction Reason	MIMO A+B (dBm)	MIMO A+B (dBm)
1	2412	14.5	13.07	17.87		1	2412	14.5	14.06	18.90		16.60	21.43
7	2442	14.5	13.16	17.85		7	2442	14.5	14.04	18.80		16.63	21.36
13	2472	14.5	13.16	18.65		13	2472	14.5	14.09	19.10		16.66	21.89
CH.	802.11n20 Freq.(MHz)	Setting	Avg (dBm)	Peak (dBm)	Power Reduction Reason	CH.	802.11n20 Freq.(MHz)	Setting	Avg (dBm)	Peak (dBm)	Power Reduction Reason	MIMO A+B (dBm)	MIMO A+B (dBm)
1	2412	14.5	12.89	17.87		1	2412	14.5	13.91	18.79		16.44	21.36
7	2442	14.5	13.17	18.08		7	2442	14.5	13.68	18.53		16.44	21.32
13	2472	14.5	13.14	18.74		13	2472	14.5	13.74	18.81		16.46	21.79
CH.	802.11n40 Freq.(MHz)	Setting	Avg (dBm)	Peak (dBm)	Power Reduction Reason	CH.	802.11n40 Freq.(MHz)	Setting	Avg (dBm)	Peak (dBm)	Power Reduction Reason	MIMO A+B (dBm)	MIMO A+B (dBm)
3	2422	14	13.10	19.54		3	2422	14	13.72	20.00		16.43	22.79
7	2442	14	13.03	19.35		7	2442	14	13.84	20.31		16.46	22.87
11	2462	14	13.01	19.92		11	2462	14	13.81	20.35		16.44	23.15

CH.	BT-1Mbps Freq.(MHz)	Setting	Avg (dBm)	Peak (dBm)	Power Reduction Reason
0	2402	8	5.69	5.89	
39	2441	8	4.44	4.66	
78	2480	8	6.52	6.69	
CH.	BT-3Mbps Freq.(MHz)	Setting	Avg (dBm)	Peak (dBm)	Power Reduction Reason
0	2402	8	2.33	5.54	
39	2441	8	1.03	4.19	
78	2480	8	3.17	6.35	
CH.	BLE Freq.(MHz)	Setting	Avg (dBm)	Peak (dBm)	Power Reduction Reason
0	2402	N/A	1.48	1.79	
19	2440	N/A	-0.02	0.37	
39	2480	N/A	0.99	1.29	

5GHz Maximum Conducted Power													
MIMO A						MIMO B						Avg	Peak
CH.	802.11a Freq.(MHz)	Setting	Avg (dBm)	Peak (dBm)	Power Reduction Reason	CH.	802.11a Freq.(MHz)	Setting	Avg (dBm)	Peak (dBm)	Power Reduction Reason	MIMO A+B (dBm)	MIMO A+B (dBm)
36	5180	16	15.05	19.71		36	5180	16	14.87	19.53		17.97	22.63
64	5320	16	14.64	19.26		64	5320	16	14.72	19.40		17.69	22.34
100	5500	17	15.42	19.89		100	5500	17	14.81	19.46		18.14	22.69
140	5700	16.5	15.87	20.45		140	5700	16.5	13.73	18.33		17.94	22.53
CH.	802.11n20 Freq.(MHz)	Setting	Avg (dBm)	Peak (dBm)	Power Reduction Reason	CH.	802.11n20 Freq.(MHz)	Setting	Avg (dBm)	Peak (dBm)	Power Reduction Reason	MIMO A+B (dBm)	MIMO A+B (dBm)
36	5180	16.5	15.28	20.07		36	5180	16.5	15.33	20.10		18.32	23.10
64	5320	16	14.50	19.34		64	5320	16	14.61	19.37		17.57	22.37
100	5500	17	15.11	19.87		100	5500	17	14.76	19.62		17.95	22.76
140	5700	16.5	15.75	20.59		140	5700	16.5	13.64	18.45		17.83	22.66
CH.	802.11n40 Freq.(MHz)	Setting	Avg (dBm)	Peak (dBm)	Power Reduction Reason	CH.	802.11n40 Freq.(MHz)	Setting	Avg (dBm)	Peak (dBm)	Power Reduction Reason	MIMO A+B (dBm)	MIMO A+B (dBm)
38	5190	16	15.24	21.41		38	5190	16	15.15	21.42		18.21	24.43
62	5310	15.5	14.42	20.67		62	5310	15.5	14.55	20.99		17.50	23.84
102	5510	16.5	15.23	21.29		102	5510	16.5	14.65	20.97		17.96	24.14
134	5670	16	15.55	21.75		134	5670	16	13.62	19.81		17.70	23.90
CH.	802.11ac80 Freq.(MHz)	Setting	Avg (dBm)	Peak (dBm)	Power Reduction Reason	CH.	802.11ac80 Freq.(MHz)	Setting	Avg (dBm)	Peak (dBm)	Power Reduction Reason	MIMO A+B (dBm)	MIMO A+B (dBm)
42	5210	16	14.88	21.44		42	5210	16	15.09	21.72		18.00	24.59
58	5290	16	14.58	21.07		58	5290	16	14.85	21.48		17.73	24.29
106	5530	17	15.59	21.75		106	5530	17	14.64	21.17		18.15	24.48
122	5610	16.5	15.48	21.74		122	5610	16.5	14.04	20.48		17.83	24.17

Lithium Battery Safety Statement

Lithium battery inside. Danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by battery manufacturer.

Lithium-Ion batteries are classified by the U. S. Federal Government as non-hazardous waste and are safe for disposal in the normal municipal waste stream. These batteries contain recyclable materials and are accepted for recycling. Dispose of used batteries in accordance with local regulations.

WARNING – Non-approved batteries will not function in the device. Use only the battery for the system for which it was specified. Only use the battery with a charging system that has been qualified with the system per this standard. Use of an unqualified battery or charger may present a risk of fire, explosion, leakage, or other hazard.

WARNING – There are no user-serviceable parts in the batteries. Do not disassemble or open, crush, bend or deform, puncture, or shred the battery. Do not modify or remanufacture, attempt to insert foreign objects into the battery, immerse or expose to water or other liquids, or expose to fire, explosion, or other hazard. Do not expose to temperatures above +60 °C (+140 °F).

WARNING – Improper battery use may result in a fire, explosion, or other hazard.

- Do not short circuit a battery or allow metallic or conductive objects to contact the battery terminals.
- Avoid dropping the device or battery. If dropped, especially on a hard surface, and the user suspects damage to the battery, take it to a service center for inspection.
- In the event of a battery leak, do not allow the liquid to come in contact with the skin or eyes. If contact has been made, wash the affected area with large amounts of water and seek medical advice.
- Battery usage by children should be supervised.

Power supply safety

-  WARNING – Use only AC and vehicle adapters intended for the device. Output rating 19 Vdc, minimum 3.42A. Other external power sources may damage your product and void the warranty.
- Ensure the input voltage on the adapter matches the voltage in your location. Ensure the Class I adapter has prongs compatible with your outlets and earthing connection.
- The AC power supply is designed for indoor use only. Avoid using the AC power supply in wet areas.
- Unplug the power supply from power when not in use.
- Do not short the output connector.

Chapter 1. Introduction

The PA501 is a rugged device equipped with 802.11, Bluetooth and GNSS for wireless data communications.

The PA501 is a rugged 10.1” tablet computer capable of 1920 x 1200

resolution. The PA501 supports the following operating systems:

- Android 9.0 (Pie) with Google Mobile Services(GMS) certified

About This Guide

The PA501 User Manual provides instruction for qualified personnel to use as a guide for setup of the device. This document is not intended to replace the training and expertise of the end-user.

Unpacking the Device

Before you begin the installation or configuration process make sure to inspect all components and accessories. Contact your representative if there are any missing or damaged items. See *“Contacting RuggON”* on page 30.

Technical Specifications

Table 1. Technical Specifications

Item	Description
Display	10.1-inch LED Backlight, WUXGA 1920 (W) x 1200 (H)
Touch screen	10-point capacitive touch screen
Brightness	1000 nits TFT LCD
CPU	Qualcomm Snapdragon 660 Octa-core 1.9GHz up to 2.2GHz
Operating System	Android 9.0 (Pie) with GMS certified
RAM	LPDDR4 3GB
Storage	eMMC 32GB
Battery	■ Standard hot swappable battery: 10.8V, 4500mAh, Li-polymer ■ Extended hot swappable battery: 10.8V, 9000mAh, Li-polymer (optional)
Power Supply	AC 100V ~ 240V, 50~60Hz input; 19VDC@3.42A, 65W
Dimensions (W x H x L)	280 mm (11”) x 23 mm (0.9”) x 195 mm (7.7”)
Weight	1.4 kg (3.09 lbs)

Item	Description
Wireless	
WLAN	Wi-Fi IEEE 802.11 a/b/g/n/ac
Bluetooth	Bluetooth v5.0 class1
WWAN	Option 4G LTE
Sensor	
Sensor	Gyroscope, G Sensor, E-compass, Light Sensor
I/O	
Docking Connector	30-pin
DC-IN Jack	x1
Micro SIM Card Slot	x2
Audio Jack	x1; headphone / microphone combo
USB	x3; USB2.0 type A x2, USB 3.1 type C x 1 (Display port supported)
RS-232	x1 (Available for option USB 2.0)
Micro SD	x1
Ethernet	x1
Security	ARM® TrustZone®
Data Collection	
Camera	■ Front: 8 MP camera ■ Rear: 13 MP camera with LED flash and Auto-focus
GNSS	YES
NFC	Optional
Barcode Reader	Optional
Fingerprint Reader	Optional

Item	Description
Rugged Specifications	
Drop	153 cm (5 feet), 26 drops on plywood
MIL-STD 810G	■ Vibration (MIL-STD-810G Method 514.7 Category 4, Fig 514.7C-2, Fig 514.7C-3, Fig 514.7C-4) ■ Drop (MIL-STD-810G Method 516.7 Procedure IV) ■ Mechanical shock (MIL-STD-810G Method 516.7 Procedure I, Procedure V) ■ Operation and storage temperature (MIL-STD-810G Method 501.6 and 502.6) ■ Humidity MIL-STD-810G Method 507.6 Humidity Procedure II Aggravated Cycles (Fig 507.6-7)
IP rating	IP65
Operating Temperature Range	-20°C (-4°F) to 60°C (140°F)
Storage Temperature Range	-30°C (-22°F) to 70°C (158°F)
Humidity	5-95% without condensation

PA501 Configuration Options

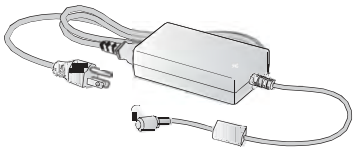
The following options are available for the PA501:

- Built-in NFC module
- Built-in 2D barcode reader (OCR supported)
- High capacity battery
- Fingerprint reader
- Snap-on connector easy for customization

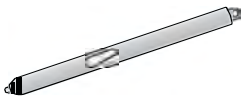
Parts List

The PA501 is shipped with the following items. All other accessories are sold and ordered separately. For help, contact your local RuggON sales representative. See *“Contacting RuggON”* on page 30.

PA501



Power Adapter



Stylus

Identifying the Device

Overview

Overview

Front View

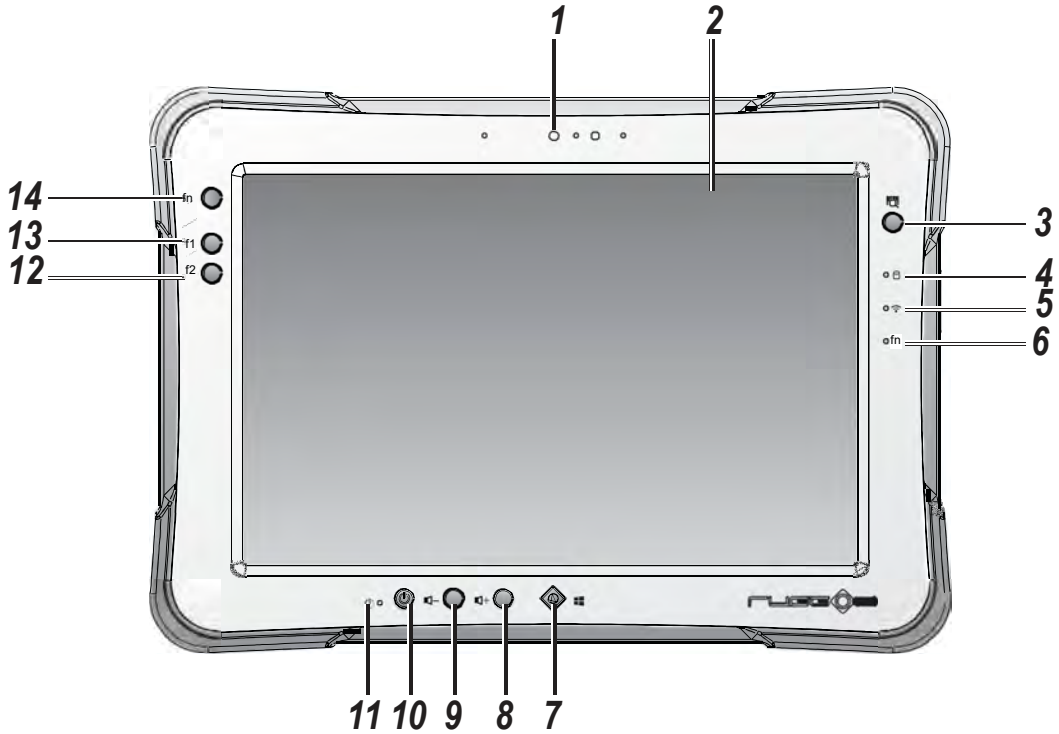


Figure 2. Front View

Table 3. Front View

No	Item	Description
1	Front camera	8.0 Mega-Pixels camera.

2	Touch screen	10-point capacitive touch.
3	Barcode trigger	If barcode scanner is installed, press to scan.
4	Battery LED	Display battery status
5	Wi-Fi LED	The Wi-Fi LED lights to indicate Wi-Fi is enabled.
6	FN LED	The FN LED lights when the function switch on.
7	Home key	Android home key.
8	Volume +	Volume increase.
9	Volume -	Volume decrease.
10	Power key	Turns the PA501 on or off.
11	Power LED	The power LED lights when the device is on.
12	F2 key	Programmable function key.
13	F1 key	Programmable function key.
14	FN key	Programmable function key.

LED Status

Table 4. LED Status

Item	Status	Description
Power	Green: On	Power on
	Off	Power off
Battery	Green: On	Fully charged
	Amber: On	Charging
	Amber: Blinking	Low power < 15%
	Off	Not charging / no battery
FN	Blue: On	FN function switch on
	Blue: Off	FN function switch off
Wi-Fi	Blue: On	Wi-Fi on
	Blue: Off	Wi-Fi off

Bottom View

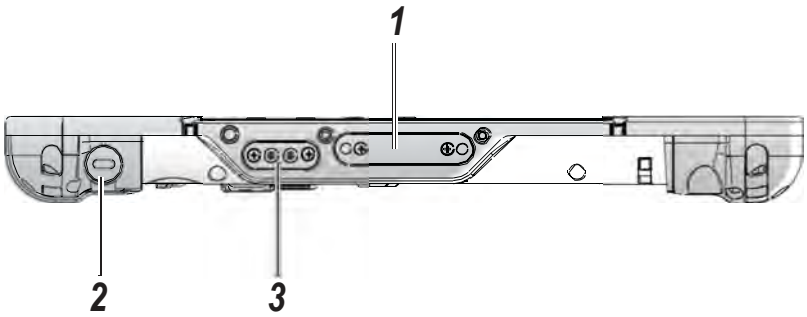


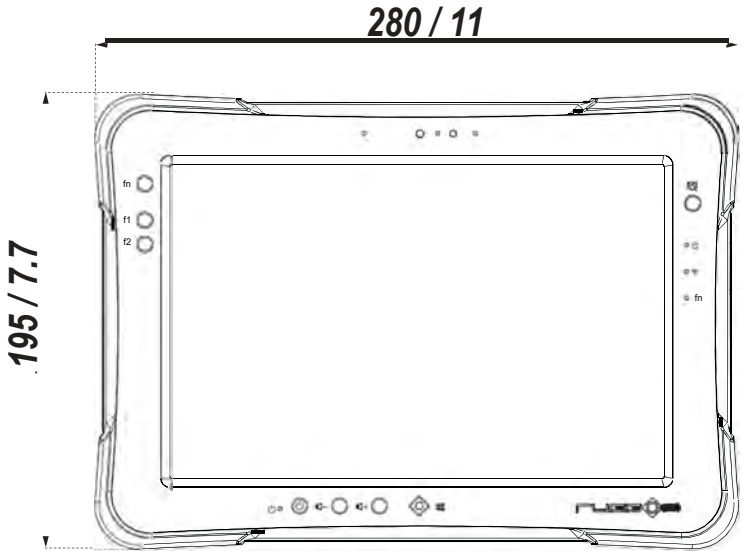
Figure 3. Bottom View

Table 5. Bottom View

No	Item	Description
1	Docking connector	30 pin connector for docking onto a station.
2	Kensington lock	Lock the PA501 to a stationary object for security.
3	Pass-through	Dual pass-through for WLAN, GNSS and WWAN.

Dimensions

The following image lists the device dimensions without add-ons (mm/inches).



Front View ions

Side View

Chapter 2. Getting Started

This section provides an outline of the steps necessary to setup a new PA501. A detailed guide follows the listed items, see as follows.

For additional technical assistance, contact your RuggON representative. See *"Contacting RuggON"* on page 30.

It is recommended to installing or remove accessories on a clean, well-lit work surface. To protect yourself and the device from electrostatic discharge, wear anti- static wrist straps or place the device on an anti-static mat.

First Time Use

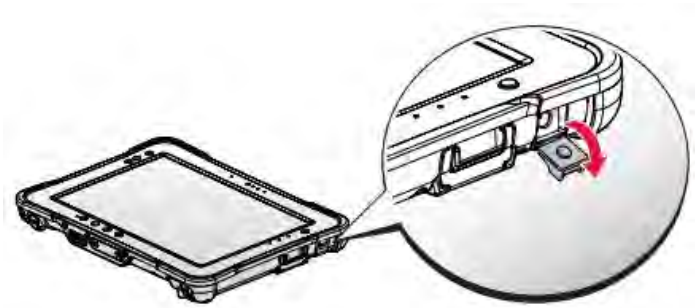
PA501 is under "Battery Ship Mode" and will not power on to preserve the battery and prevent power loss. To enable "Regular Mode" and activate the battery, please connect the power adapter to power on.

Charging the Battery

When you use the AC adapter to connect your PA501 to a power outlet, the standard and external (optional) battery will automatically begin to recharge.

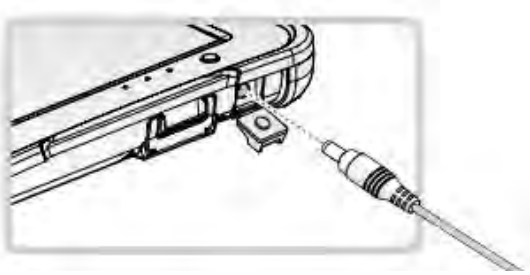
While the battery is charging, the power LED will be active. When the battery is fully charged, the power LED is lit a solid green.

1. Flip open the DC-IN cover to expose the DC-IN jack.



Opening the DC-IN Cover

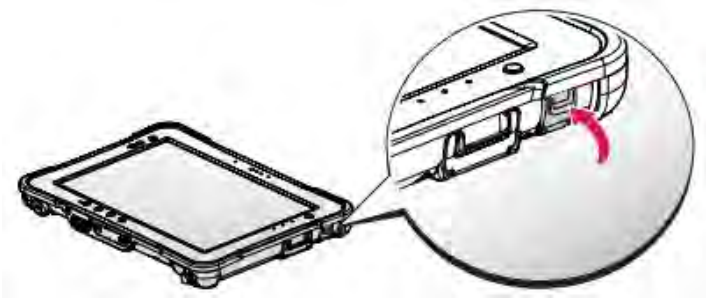
2. Connect the AC adapter to the DC-IN port.



Connecting the AC Adapter

After charging the battery, disconnect the AC adapter and close the DC-IN cover.

1. Insert one end of the cover first and angle the cover to seat it in place.
2. Push in the cover to seal the DC-IN compartment.



Closing the DC-IN Cover

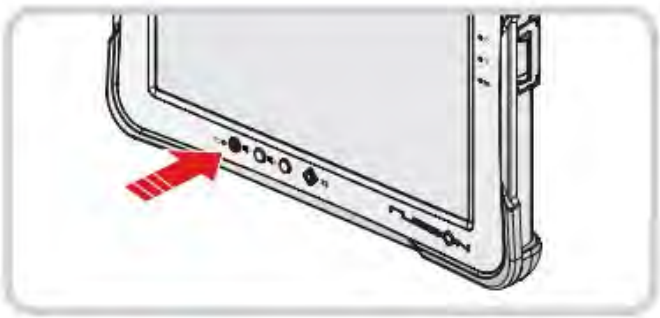
The DC-IN cover must be inserted correctly to prevent internal damage to the device.

Powering the Device On and Off

Powering On the Device

Only power on the PA501 after connecting all of the peripherals and cabling.

1. Press and hold the power button until the screen lights. The device runs through the start up sequence and powers up.



Power On the PA501

Powering Off the Device

- Start screen:

  Tap > **Shut down**.

- Desktop screen:

  1. Tap and hold at the bottom left corner of the Desktop screen.
  2. Tap **Shut down or sign out** > **Shut down**.

- Both Start screen and Desktop screen:

  1. Display charm bar and tap **Settings**.
  2. Tap **Power** > **Shut down**.

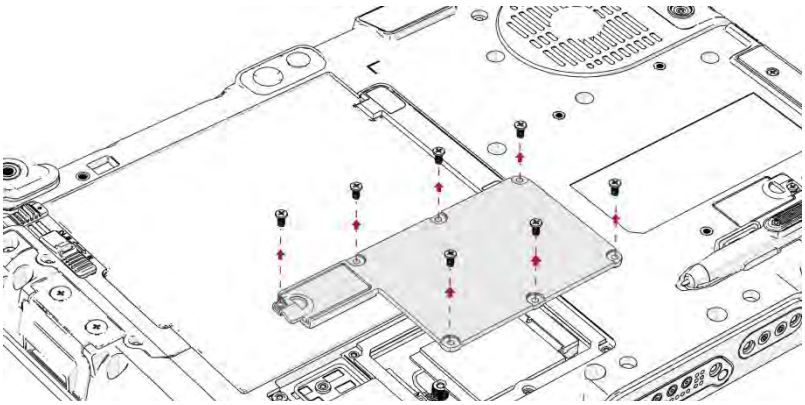
Installing the Micro SIM 2 Card

The device includes a micro SIM 2 card slot for cellular and wireless connection. Only a micro SIM card is supported in the slot.

Check with your network or cellular service provider for availability and cost rates.

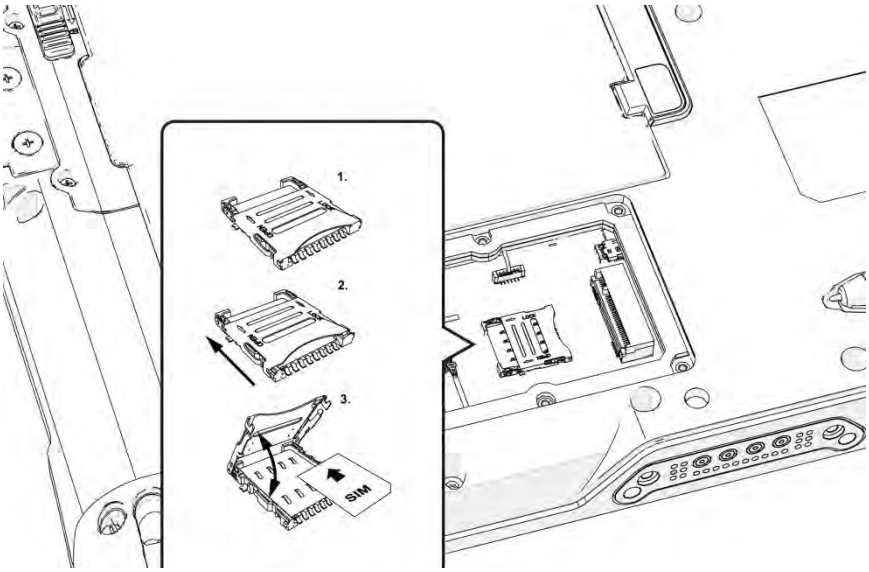
1. Power off the PA501. See *"Powering Off the Device"* on page 19.
2. Remove the service door and its screws.

Back View



Back View: Remove Service Door

3. Take the micro SIM 2 card from its packaging.
4. Push the SIM 2 card cover to open and place the micro SIM 2 card to the slot.
5. Close the SIM 2 card cover.

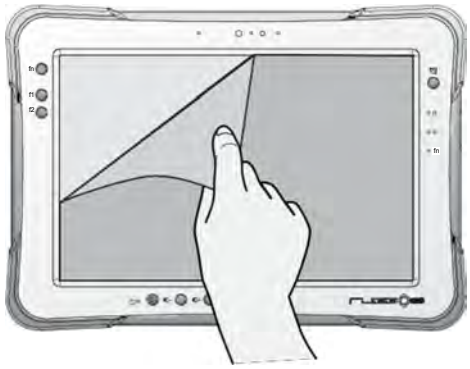


Installing the Micro SIM Card

Removing the Protective Film from the Display

The front display of the PA501 is protected during transport by a transparent film. This film should remain on the front display during assembly to avoid damage to the front display surface.

Only remove the film once all of the assembly work has been completed.

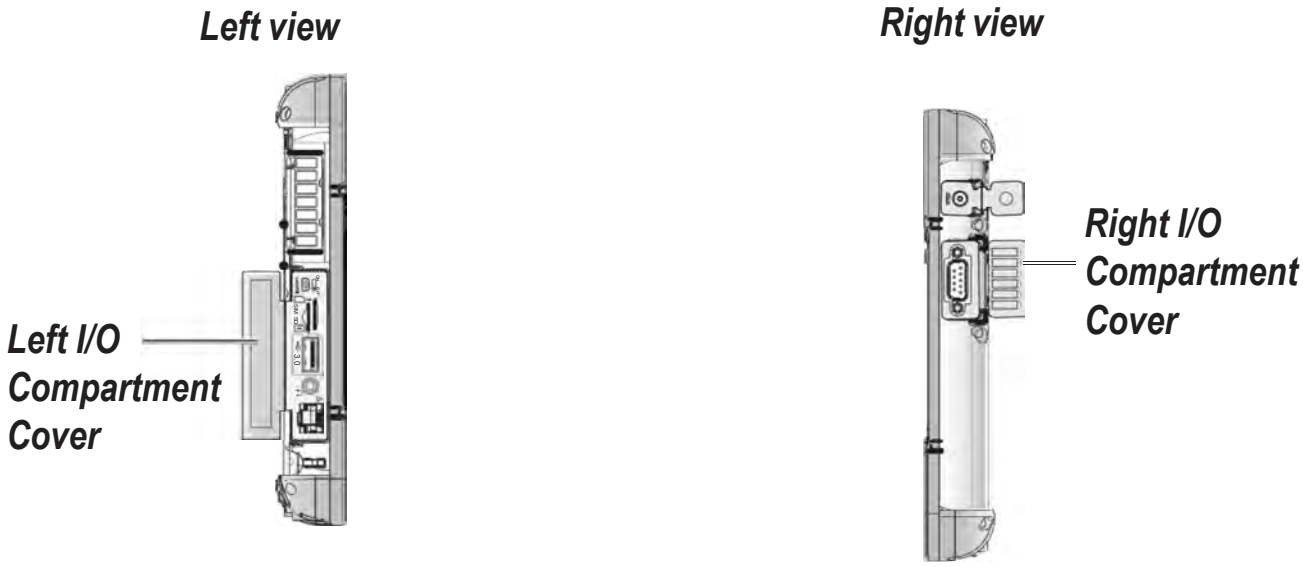


Removing the Protective Film

Chapter 3. Operation

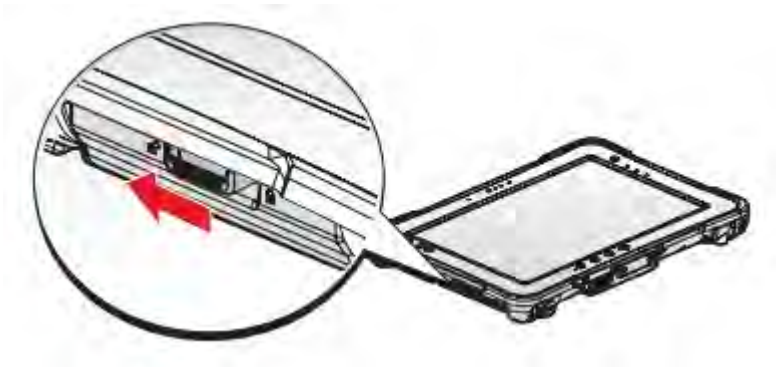
Opening the I/O Compartment Cover

1. Place the device display side down on a clean work surface.
2. Locate the I/O compartment cover.



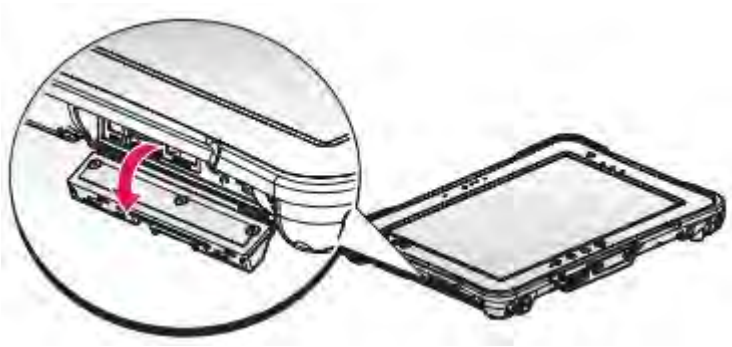
Side View: Locating the I/O Compartment Cover

3. Unlock the latch. (Only available for the left I/O compartment cover)



Unlocking the Latch

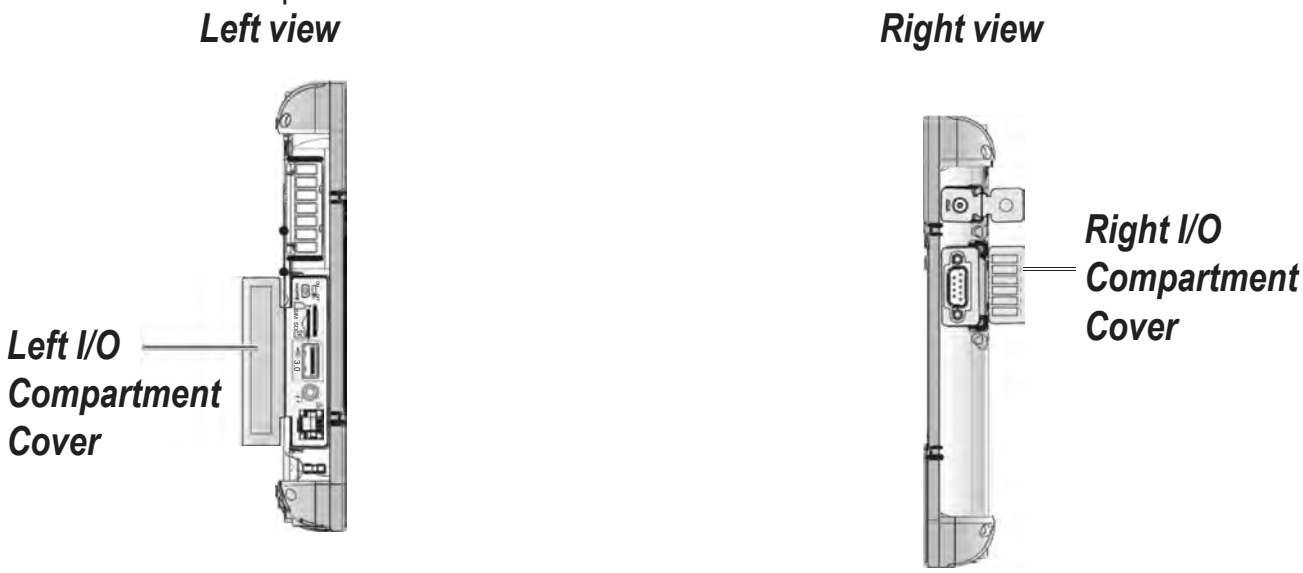
4. Pull out the I/O compartment cover.



Opening the I/O Compartment Cover

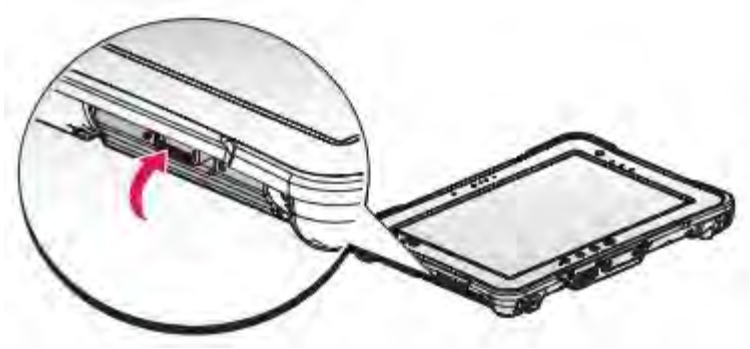
Closing the I/O Compartment Cover

1. Place the device display side down on a clean work surface.
2. Locate the I/O compartment cover.



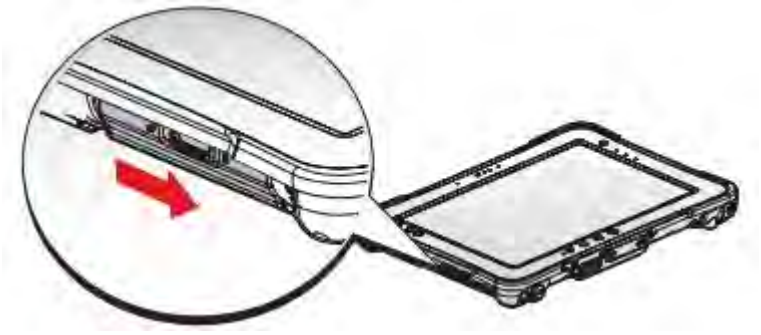
Side View: Locating the I/O Compartment Cover

3. Flip the I/O compartment cover and install.



Installing the I/O Compartment Cover

4. Lock the latch. (Only available for the left I/O compartment cover)



Locking the Latch

The I/O compartment cover must be inserted correctly to prevent internal damage to the device.

Connecting to External Cabling

To prevent damage to the device, connect all cabling and accessories before powering up the device.

Connect USB Cabling

The PA501 have one USB 3.1 Type C and two USB 2.0 Type A port for connecting USB devices, such as a digital camera, scanner, printer, modem, and mouse. The USB Type A port support USB 2.0 devices.

Connect Ethernet Cabling

The PA501 provides a Ethernet port for connecting Ethernet.

Use a shielded cable is required to maintain emissions and susceptibility compliance.

Connect LAN cable to Ethernet port on the PA501.

Connect Audio Cabling

For higher audio quality, you can send sound through external audio devices such as speakers, headphones, or earphone using audio connector.

Connect RS-232 Cabling

Connect to RS-232 devices with an RS-232 cable.

1. Open the right I/O compartment cover
2. Align the RS-232 cable with the port in the device and connect it.
3. Turn the locking screws on the cable to secure it to the device.

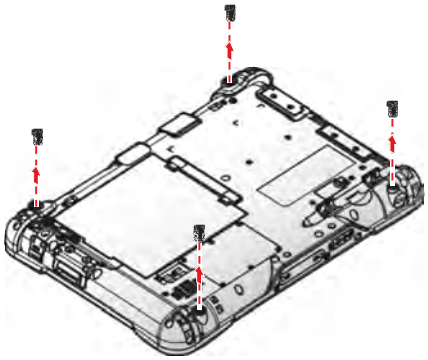
Handstrap, Carrying Handle and Shoulder Strap (Optional)

The PA501 can be optionally equipped with a handstrap, a carrying handle or a shoulder strap for convenience and choice. Select the accessory that is right for your needs.

The handstrap can be installed with either the shoulder strap or the carrying handle. However, the handle and shoulder strap can not be installed together due to space constraints.

Connecting the Handstrap

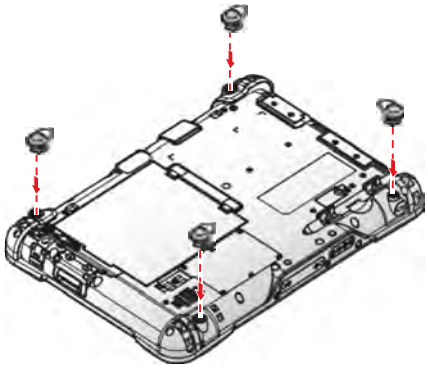
1. Remove the screws securing the bumpers.



Removing the Screws

2. Install the D-rings.

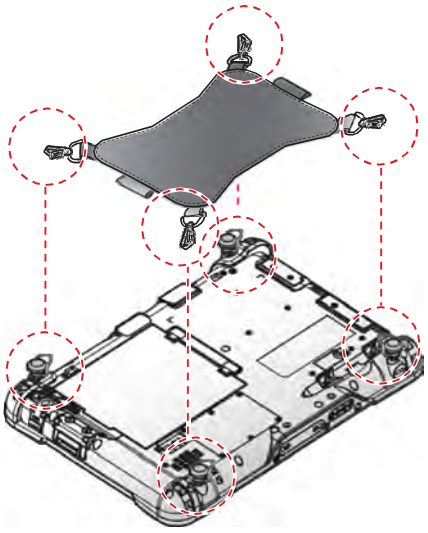
Make sure the D-rings are tightly secured before installing the handstrap.



Installing the D-rings

3. Connect the handstrap on the D-rings.

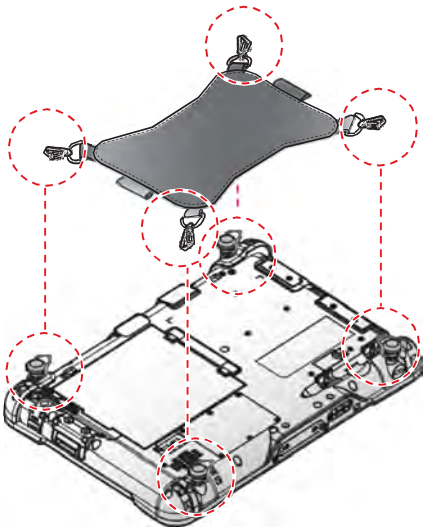
When the handstrap is installed, the digitizer can be placed under the strap.



Connecting the Handstrap

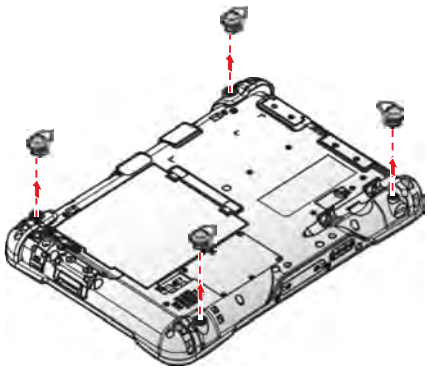
Removing the Handstrap

1. Unlock the handstrap from the D-rings.



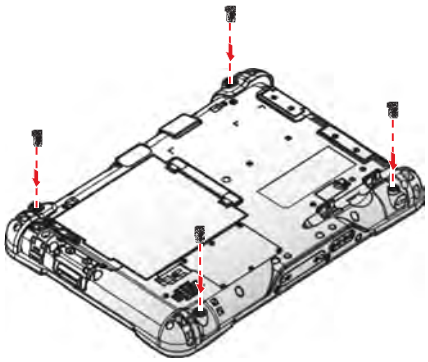
Removing the Handstrap

2. Remove the D-rings.



Removing the D-rings

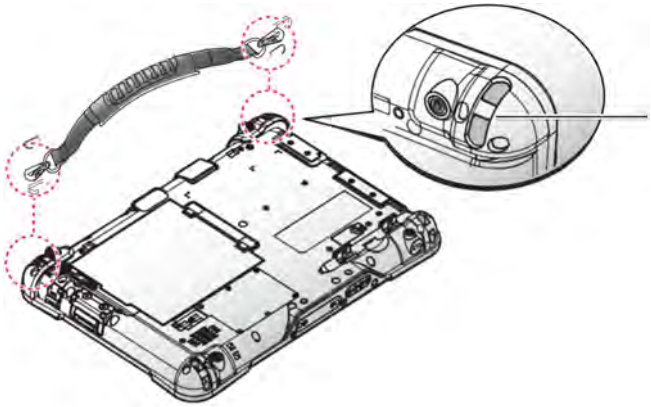
3. Secure the bumper and the PA501 with screws.



Securing the Screws

Connecting the Carrying Handle

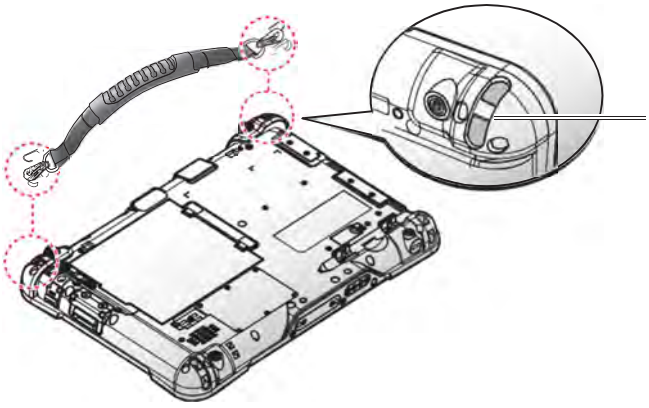
1. Attach the clips to the D-rings.



Connecting the Carrying Handle

Removing the Carrying Handle

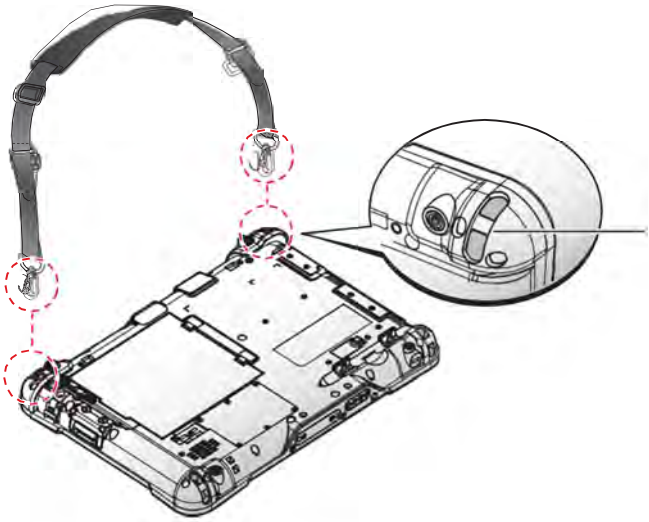
1. Press in the clips to release them from the D-rings.
2. Remove the clips.



Removing the Carrying Handle

Connecting the Shoulder Strap

1. Attach the clips to the D-rings.

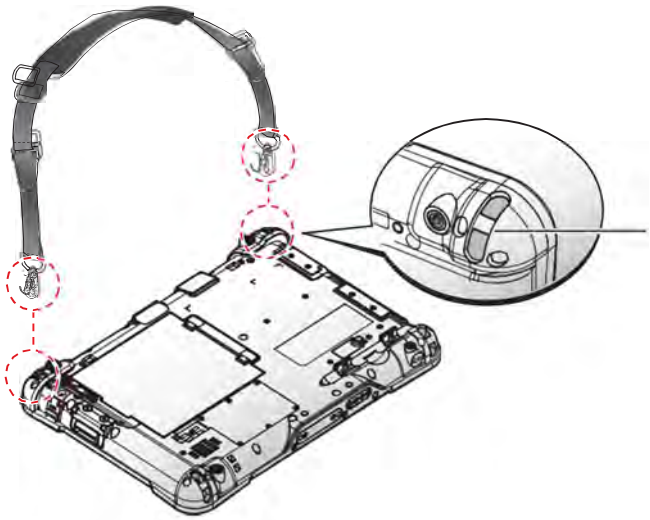


Connecting the Shoulder Strap

Removing the Shoulder Strap

1. Press in the clips to release them from the D-rings.
2. Remove the clips.

1.



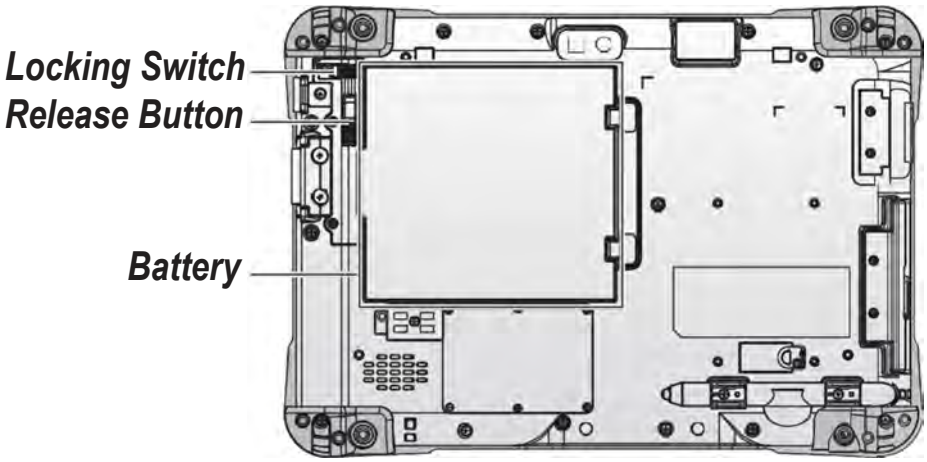
Removing the Shoulder Strap

Installing the Standard Battery

The following instructions are for both standard and external batteries. The external battery is an optional component. Only use components specifically designed for this device. Contact your local representative for ordering information.

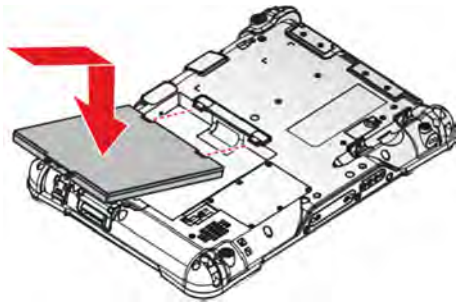
Make sure the power switch is switched to ON before installing the standard/external battery

1. Place the device display side down on a clean work surface.
2. Locate the battery.



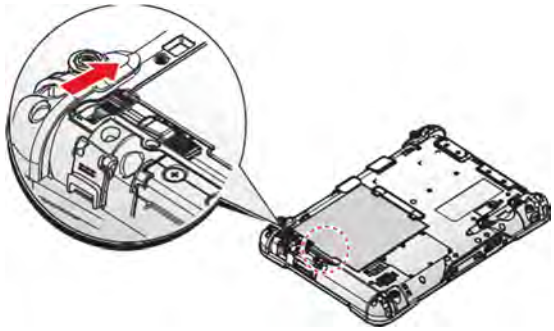
Rear View: Locating the Battery

3. Align the tabs on the battery with the slots on the chassis.
4. Angle the battery in place and set the tabs in the chassis slots.
5. Lower the raised end of the battery and press in place until an audible click is heard.



Installing the Battery

6. Slide the locking switch on the top-left side to lock the battery.

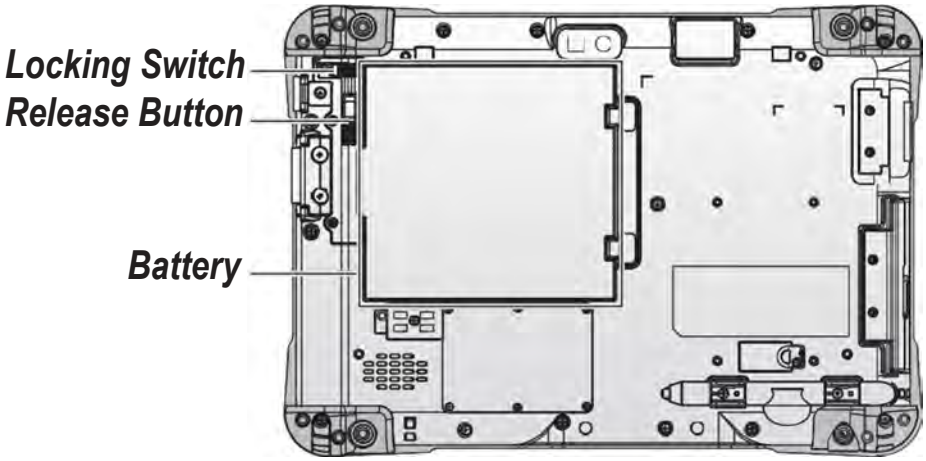


Locking the Battery

Make sure the latch is securely locked to prevent the battery from falling.

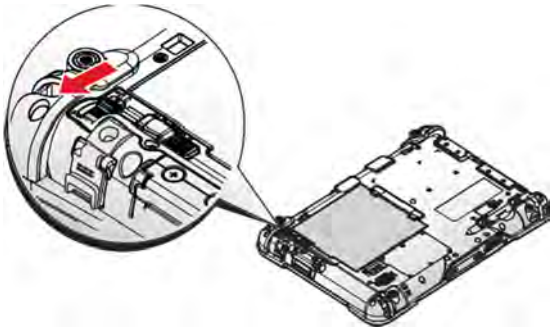
Removing the Standard Battery

1. Place the device display side down on a clean work surface.
2. Locate the battery.



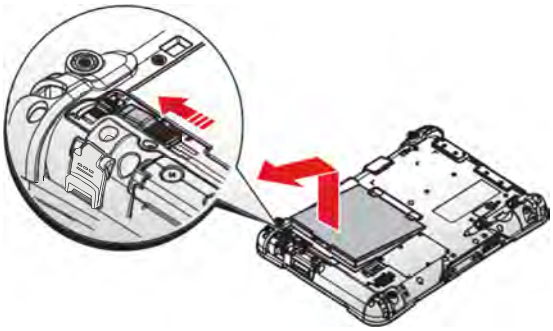
Rear View: Locating the Battery

3. Slide the locking switch on the top-left side to the unlock position.



Unlock the Battery

4. Press and hold the release button as shown in the image to release the battery.
5. Hold the battery and angle the left side up to remove.



Removing the Battery

Checking Battery Status

You can check battery status without turning on PA501. When PA501 is off, press “Barcode trigger” key and the LED indicators will show the battery status as below:

Battery Status	LED Indicator
Above 80% capacity	Three indicators on
50% - 80% capacity	Two indicators on
20% - 50% capacity	One indicator on
Below 20% capacity	One indicator blinking

Connecting to a Wireless Network

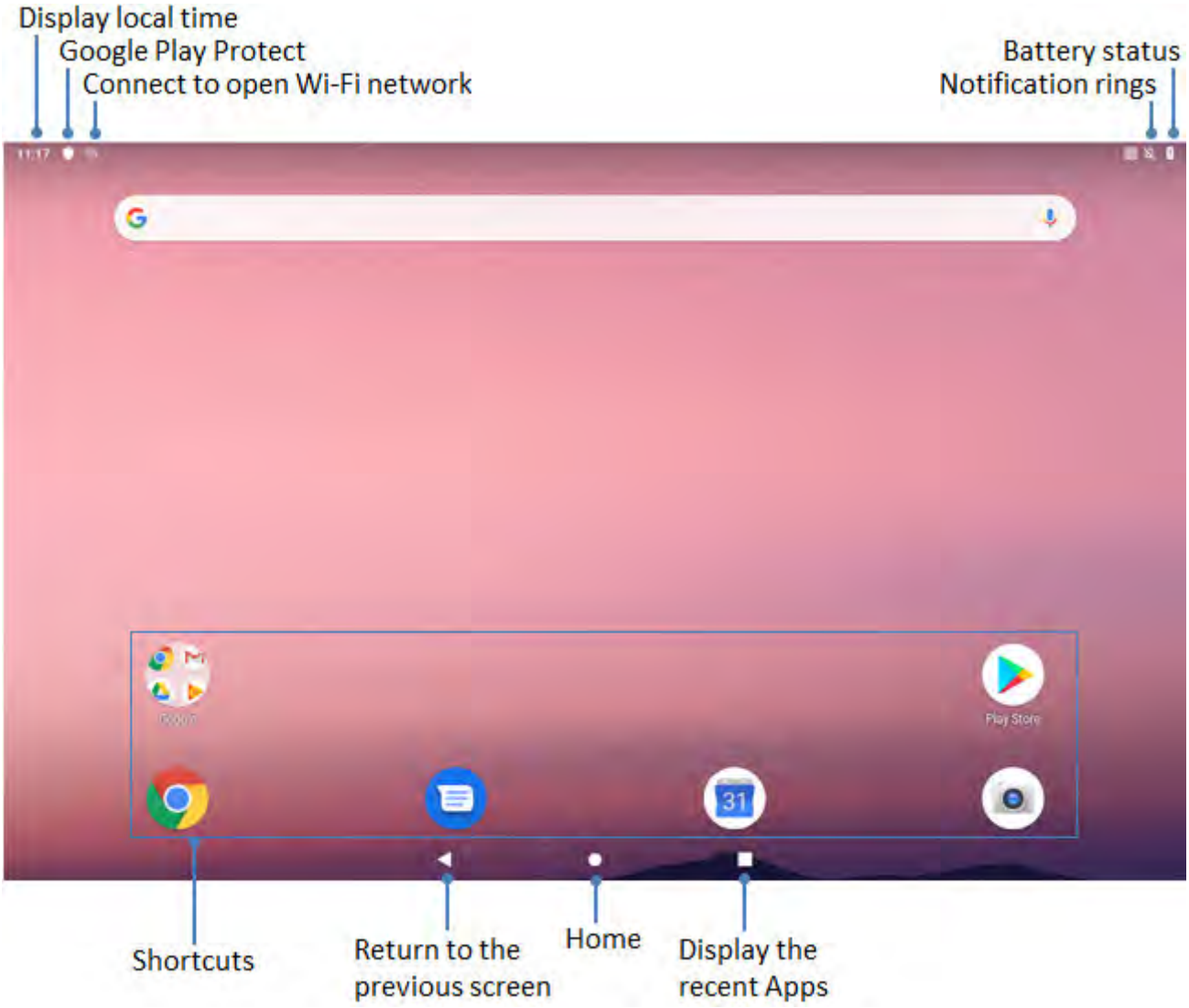
Before you can make use of the PA501 wireless functions, you need to connect to a network. The following is a set of procedures for connecting to a wireless network.

1. Before beginning, make sure your Wi-Fi setting is enabled and you are within range of a wireless network. If your Wi-Fi setting is disabled, proceed to step 2.
   - Look at the Network icon located at the right side of the taskbar. If the icon displays an X in a red circle, you are not within range of a wireless network. Move to a different spot until the Wi-Fi icon changes status indicating availability to a wireless network.
2. From any screen, open the Charms bar by sliding your finger inward from the screen's right edge. The Charms bar displays along the screen's right side.
3. In the Charms bar, tap **Settings** to open the **Settings** menu.
4. In **Settings**, tap the Network icon to display the Networks connection settings.
5. The Wi-Fi menu displays. By default, the Wi-Fi menu is set to Off. Tap the bar next to Off to toggle Wi-Fi to On. This enables the Wi-Fi option.
6. Once W-Fi is enabled a listing of all available wireless networks displays. The wireless networks with the strongest signal are atop the list.
7. Select the network you want to connect to, and tap the **Connect** button. You can tap the **Connect Automatically** check box if you connect to this network frequently. If you connect to the network, you are finished with the process. The network is considered an Open unsecured network, no password is required.
8. If a password is required, type the password in the **Enter the network security key** field. Alternatively, you can also push the WPS button on your router to begin the security handshake.
9. Tap **Next** to finish the connection process.

You have successfully connected to a wireless network.

Chapter 4. Apps and Settings

Desktop



Touch Panel Control

Do not allow the touchscreen to come into contact with other electrical devices. Electrostatic discharges can cause the touchscreen malfunction.

To avoid damaging the touchscreen, do not tap it with anything sharp or apply excessive pressure to it with your fingertip.

It is recommended not to use fixed graphics on part or all of the touchscreen for extended periods. Doing so may result in afterimages (screen burn-in) or ghosting.

The device may not recognize touch inputs close to the edges of the screen, which are outside of the touch input area.

It is recommended to use fingers when you use the touchscreen

Single tap

Single tap on the touch panel screen lets activate an application.

Longer press tap

Long-pressing an application allows you to drag and drop the application or the application shortcut to another desktop.

Long-pressing a desired file in the File Manager allows you to copy, cut, rename or delete the selected file

Swiping

Swipe upwards, downwards, to the left, or to the right.

Spreading and pinching

Spread two fingers apart or pinch on the screen.

Input, insert, select or copy texts

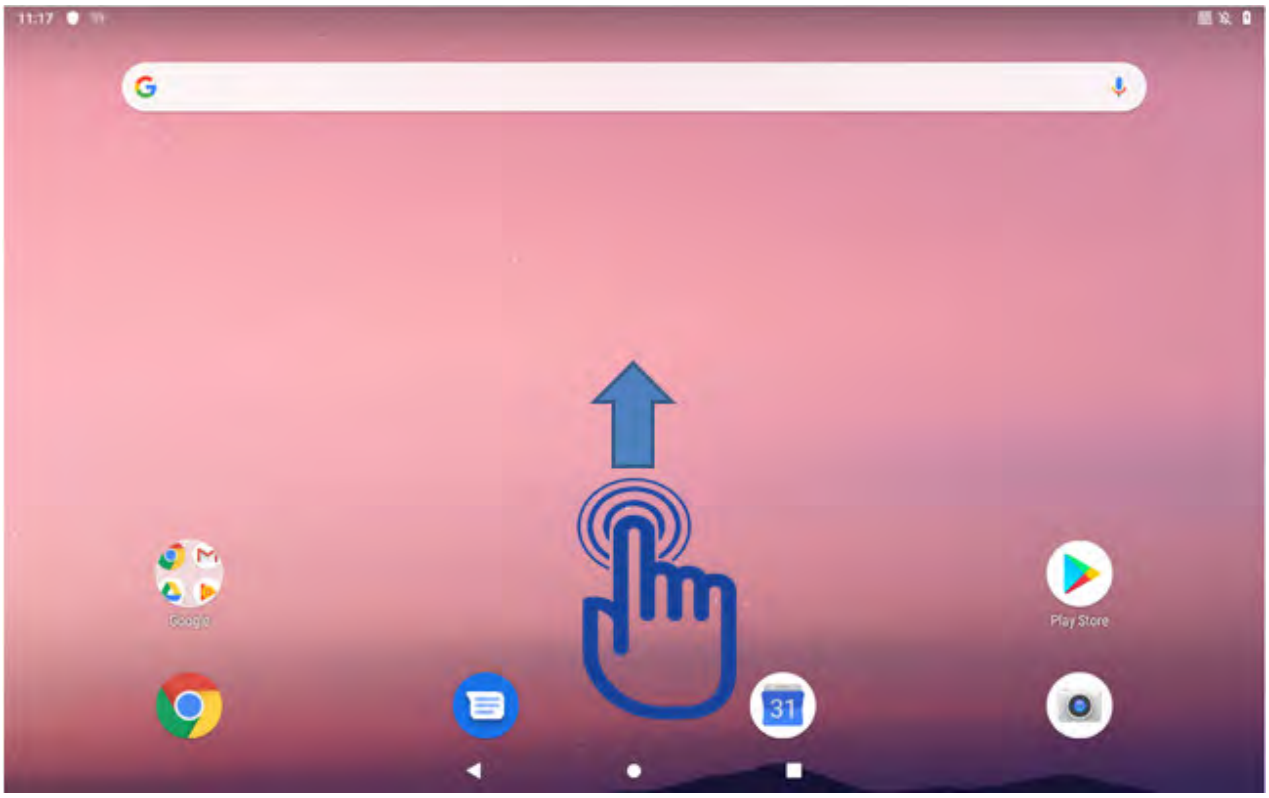
The keyboard appears when you use word processor to edit documents or enter the web address on the web browser address bar.

Check system information

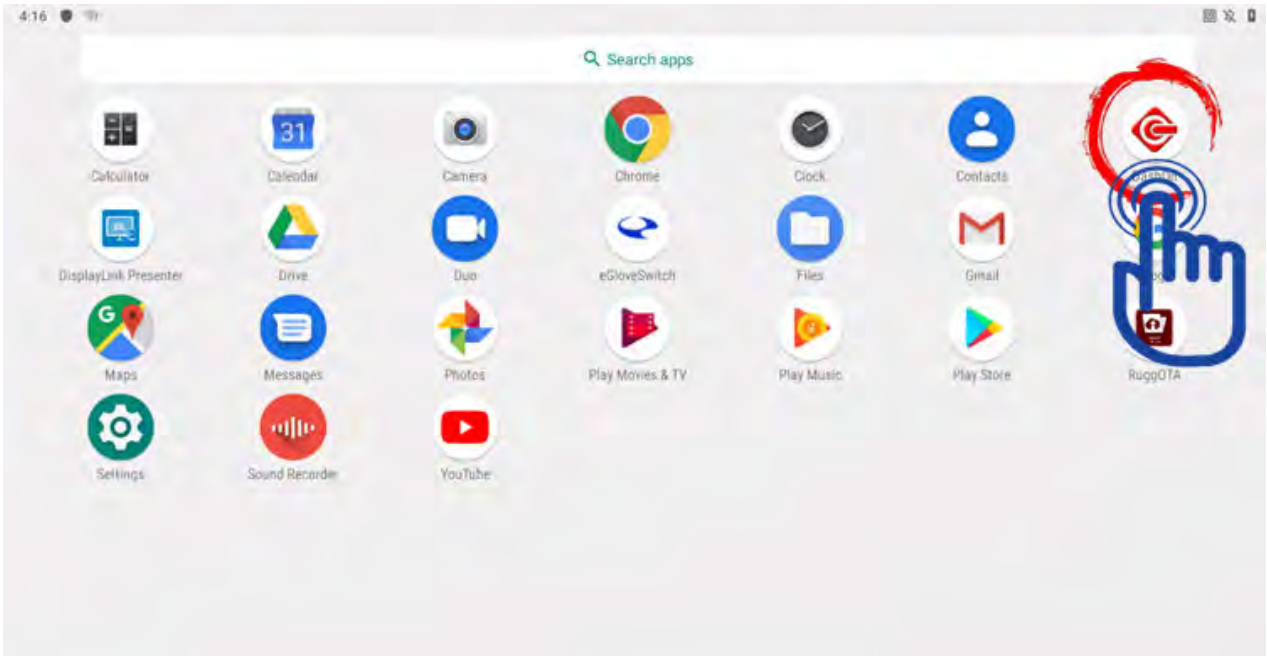
View system specifications

There are two ways to view system specifications.

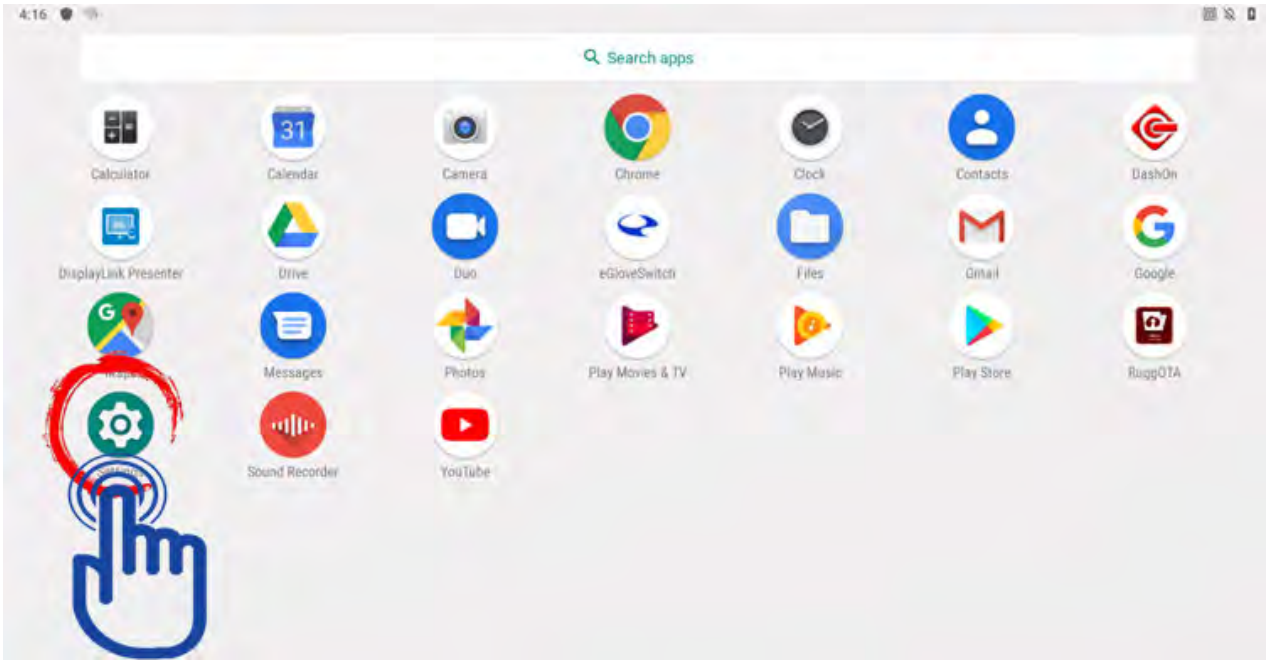
Swipe upward on desktop



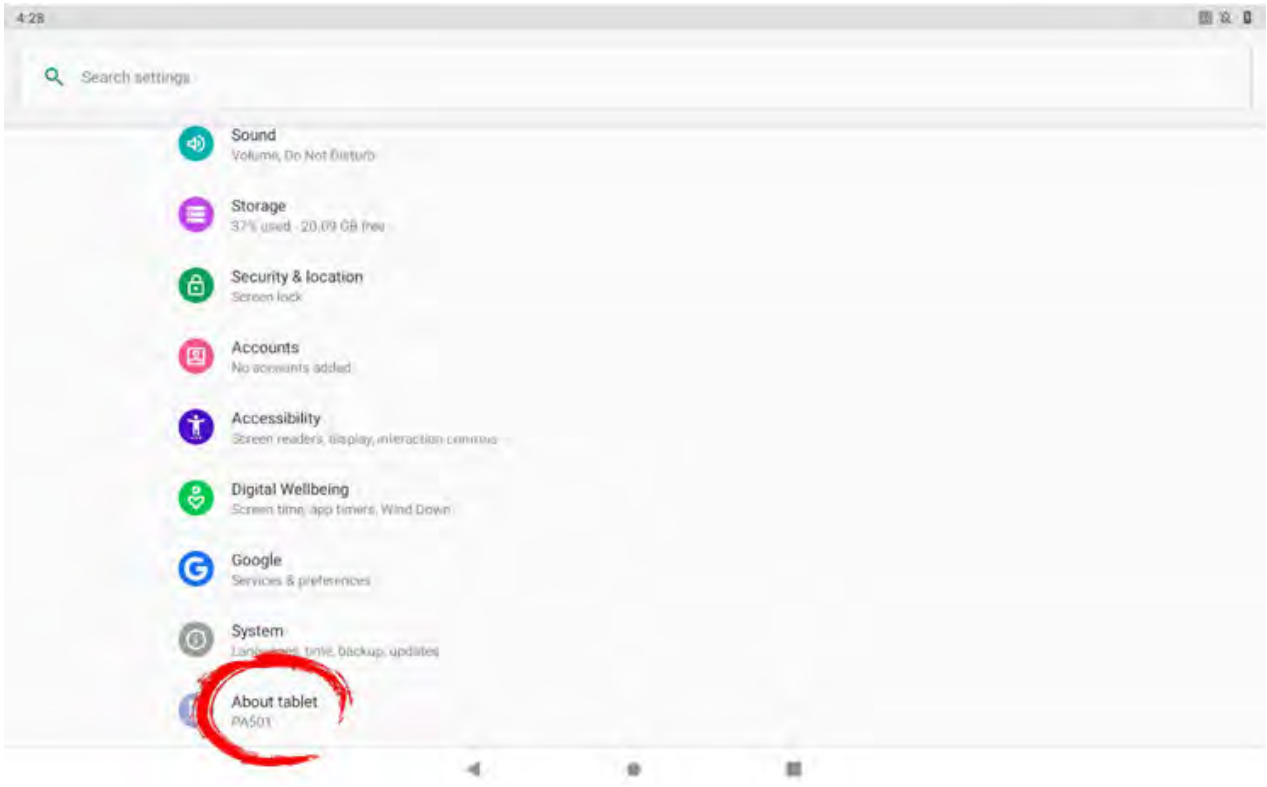
1) Tap “DashON” App. Detail see “Chapter 5 RuggON DashON Utility”



2) Tap “Settings” to view and configure all of the system settings



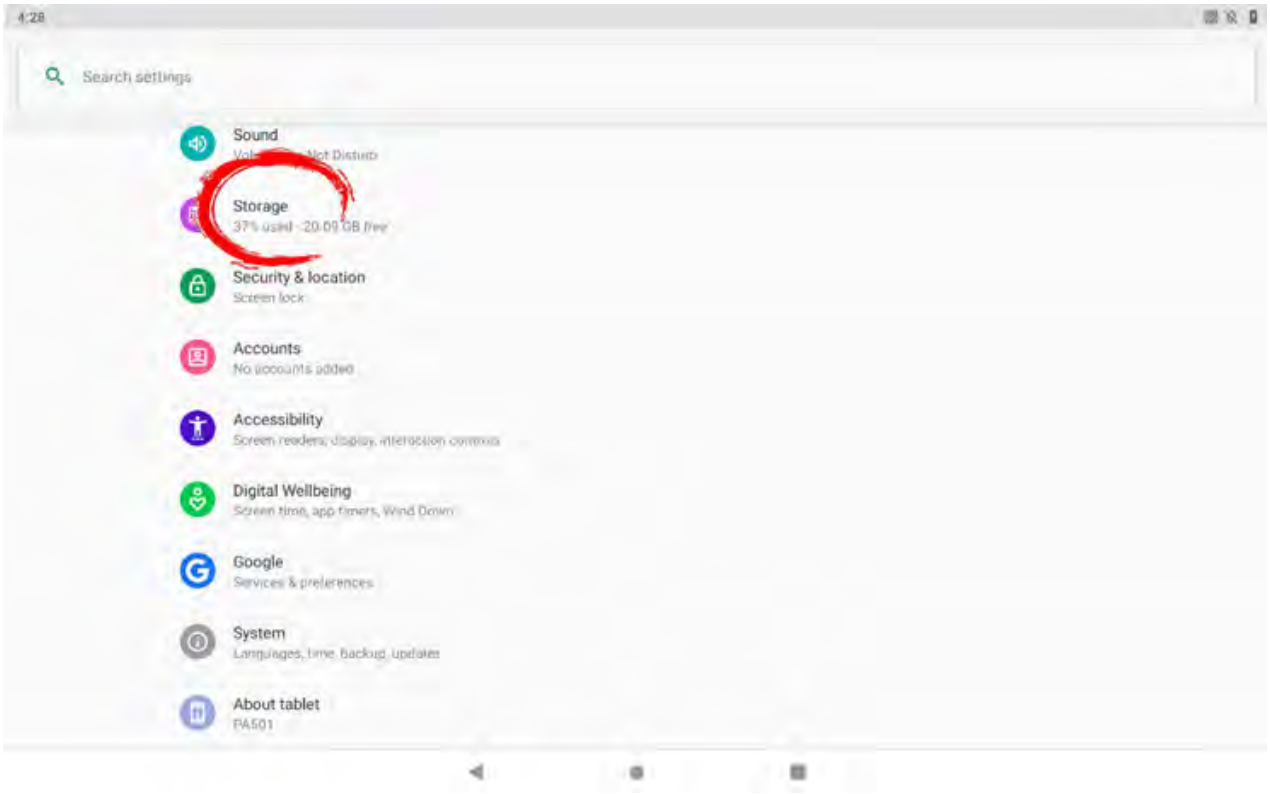
Select “About tablet” to view the tablet information



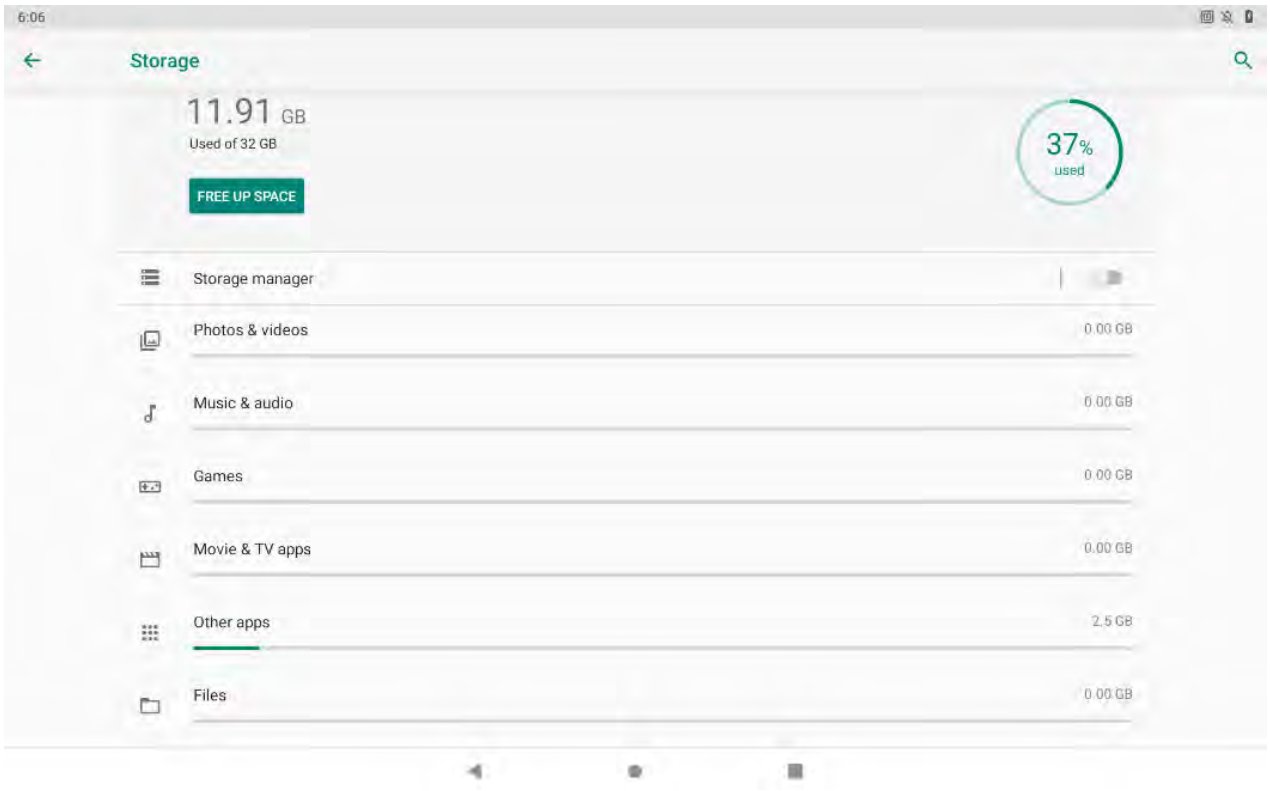
Shows the system specifications

Check the storage status

Select “Storage” to view the storage information



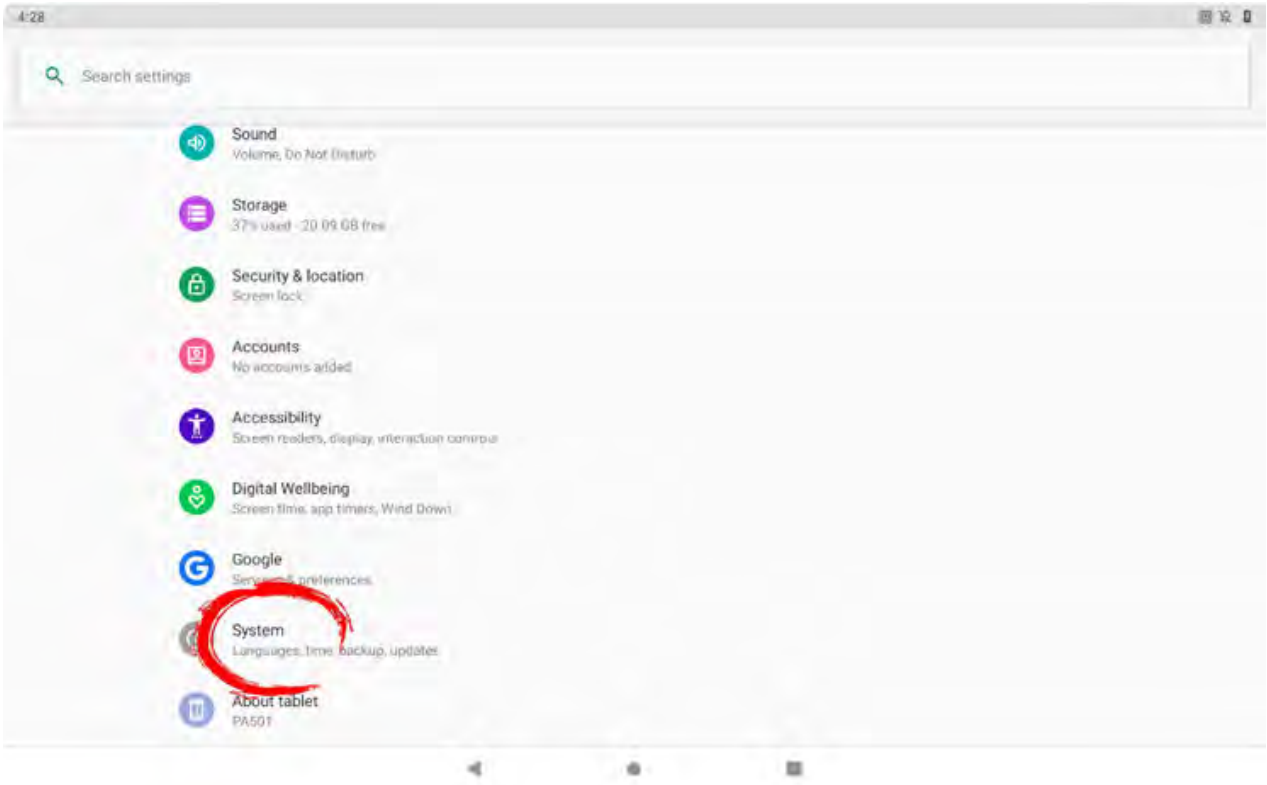
Shows the status of Storage



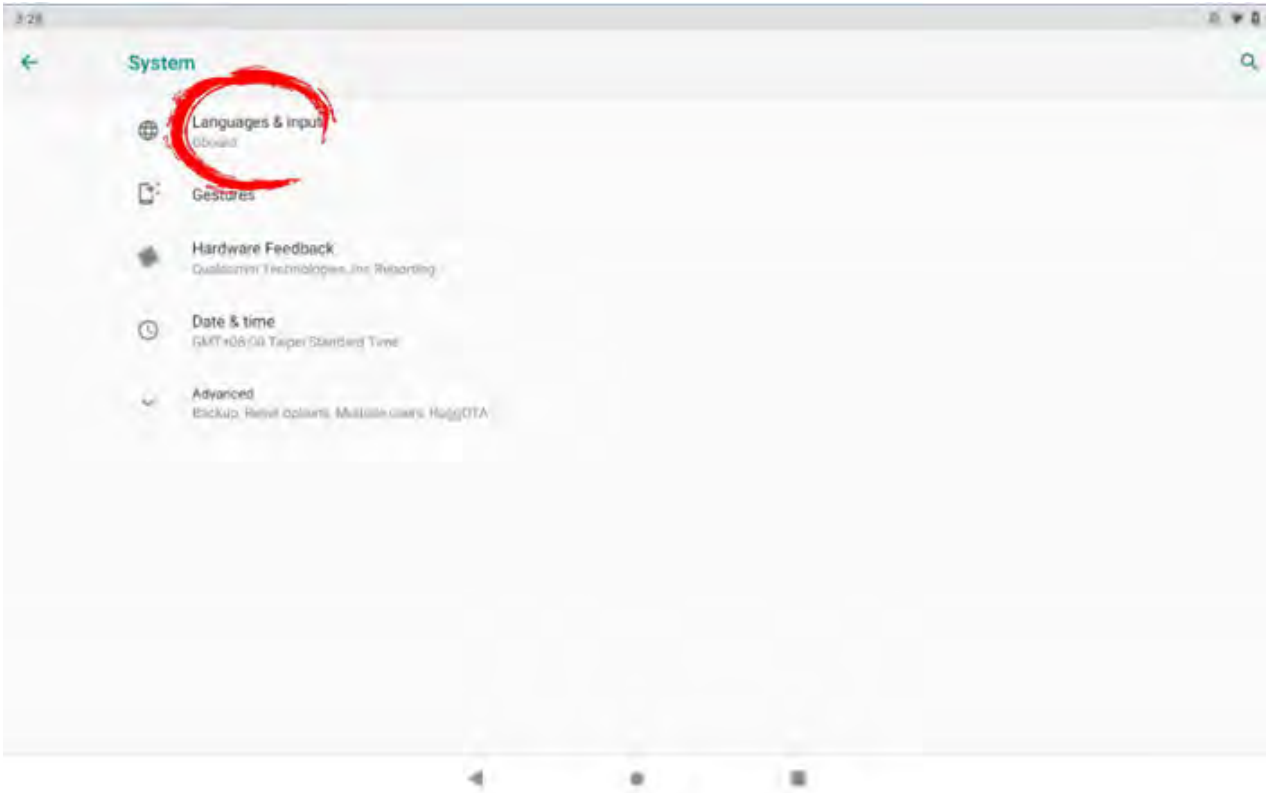
Check the system languages

Select “System” to view and configure system settings

While entry “System”, can tap Advanced to do more settings

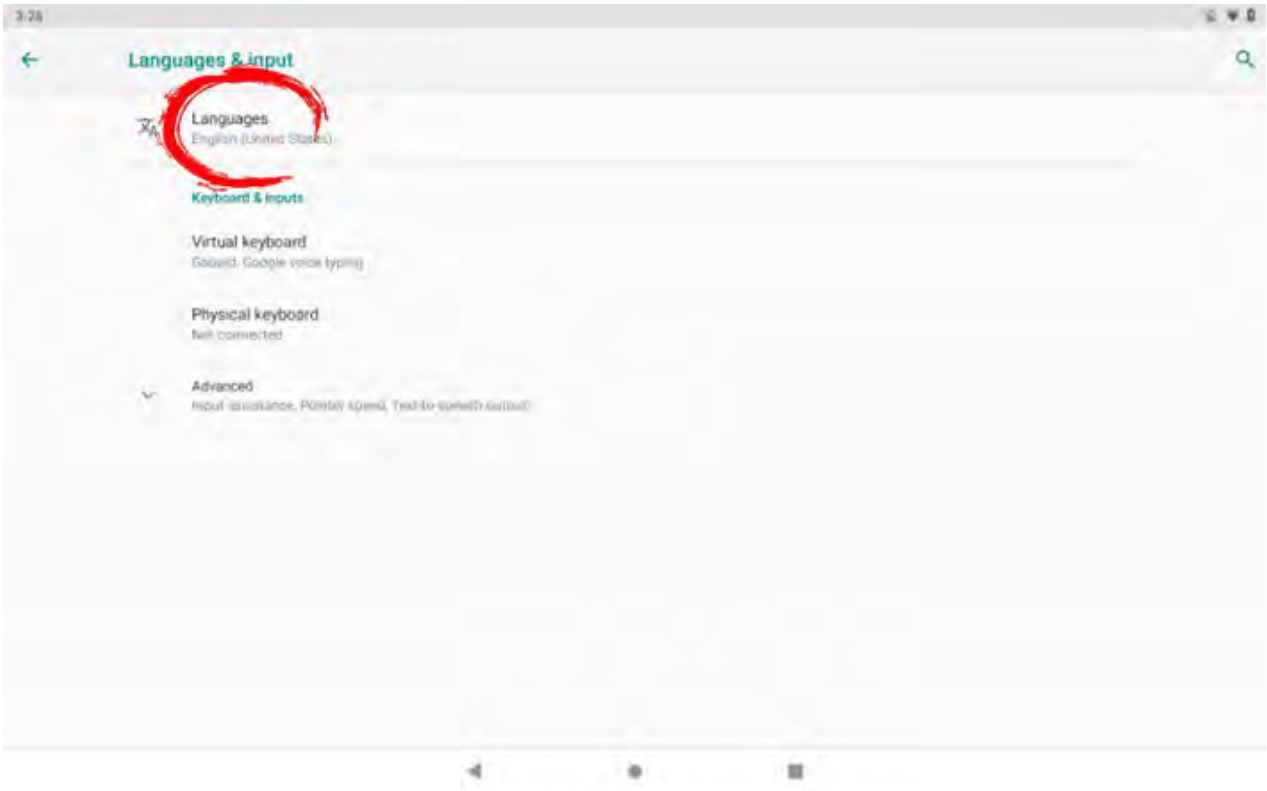


Select “Languages & Input”

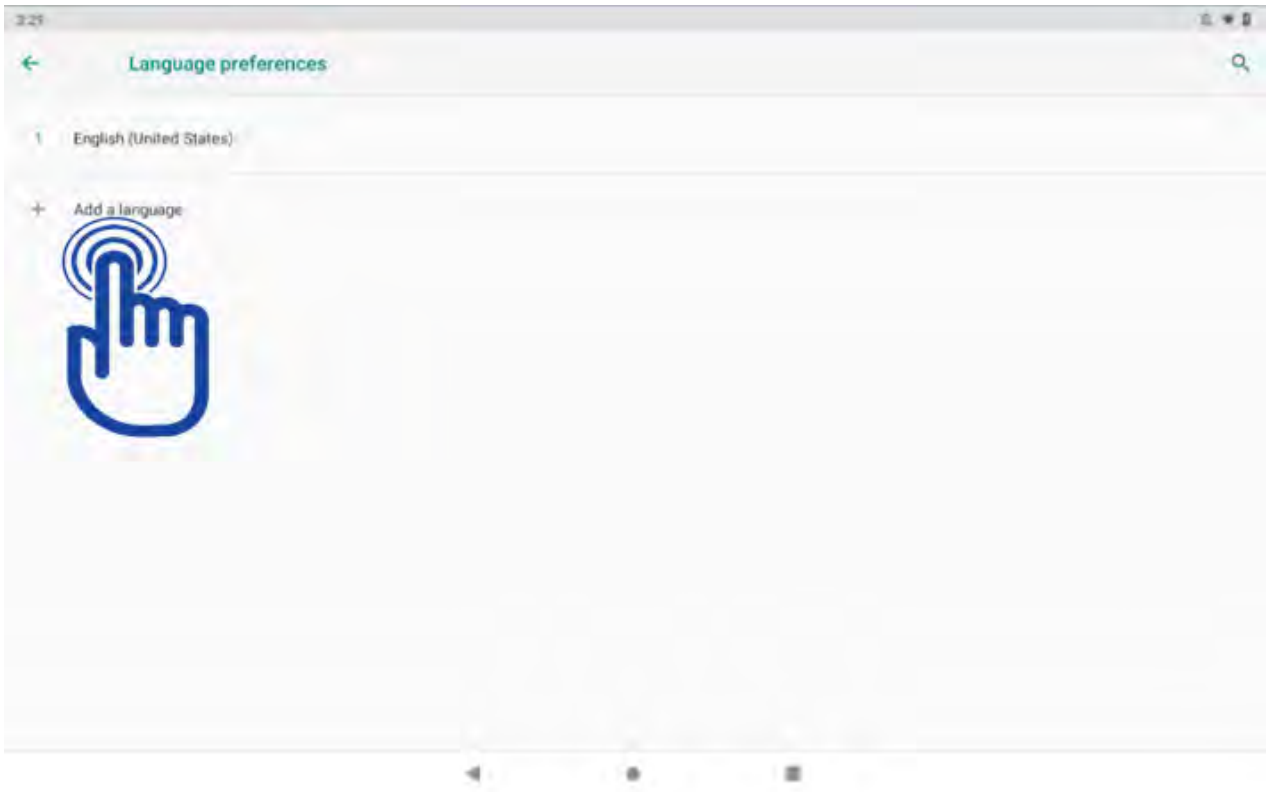


Select “Languages” to configure the language settings

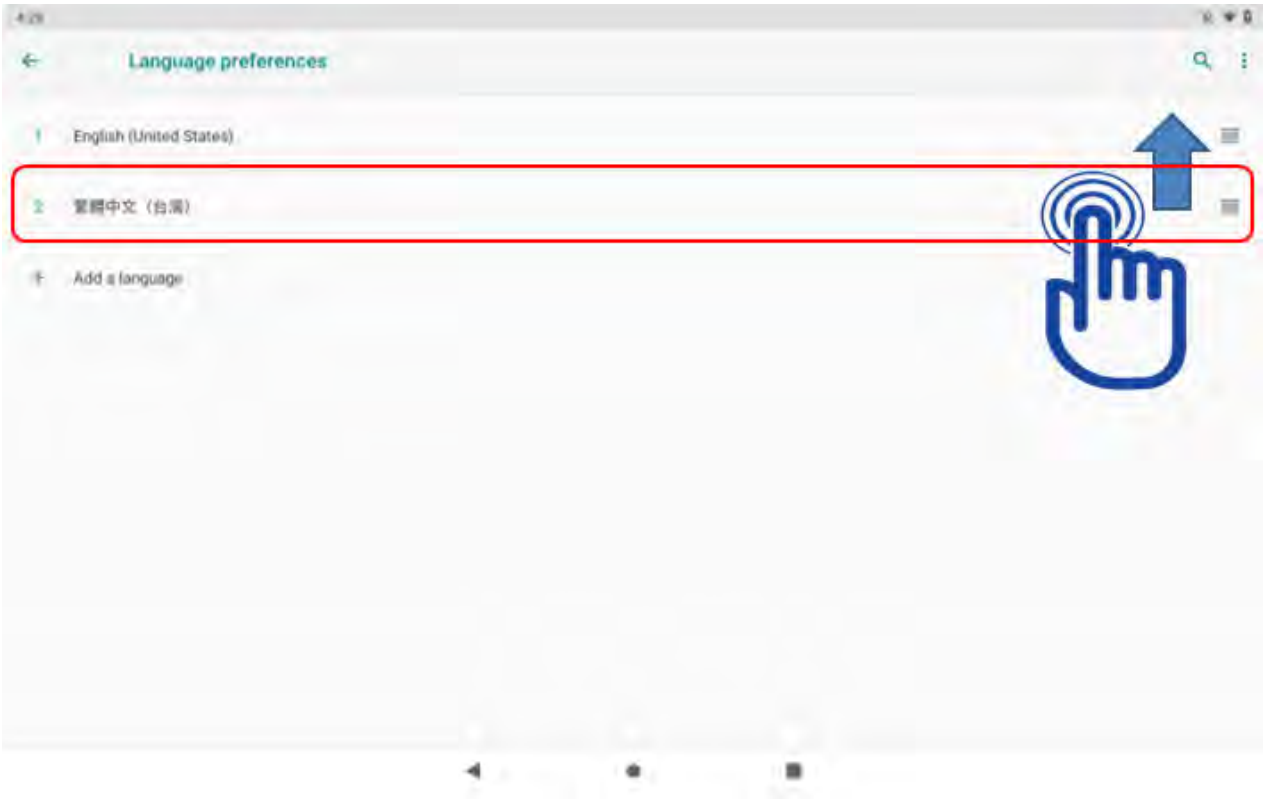
English (United Status) is the default



Tap “add a language” to choose and change languages

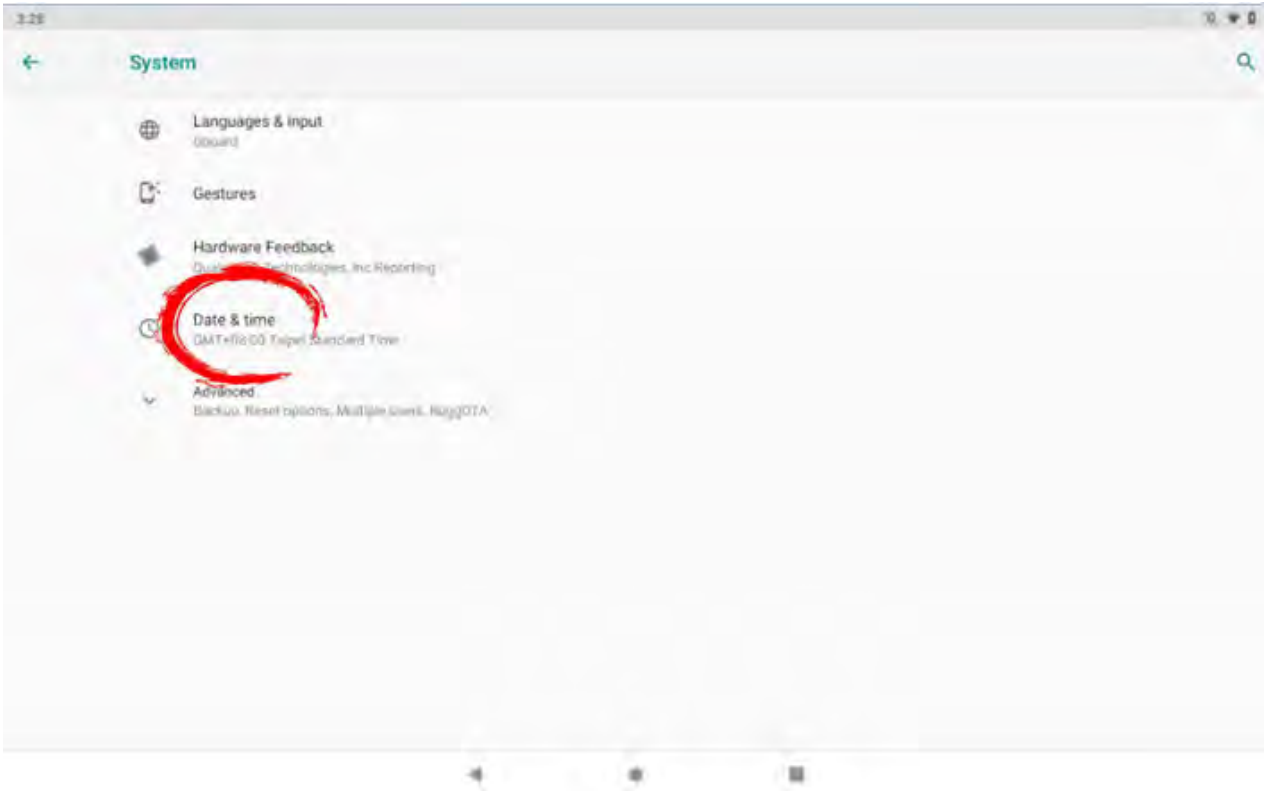


After adding a language, please long-pressing the bar and move it to the “1” position

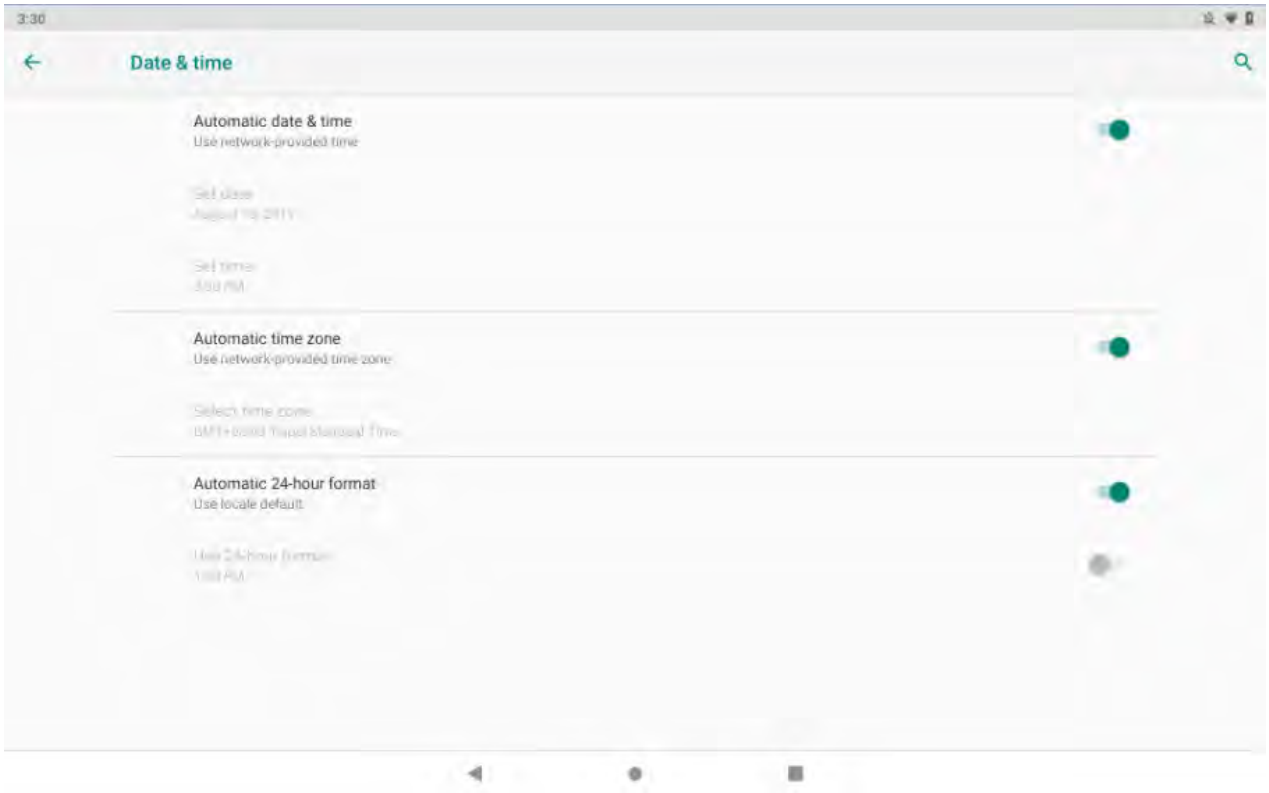


Check the date and time

Select “Date & time”



Make sure the “Date & time” is correct

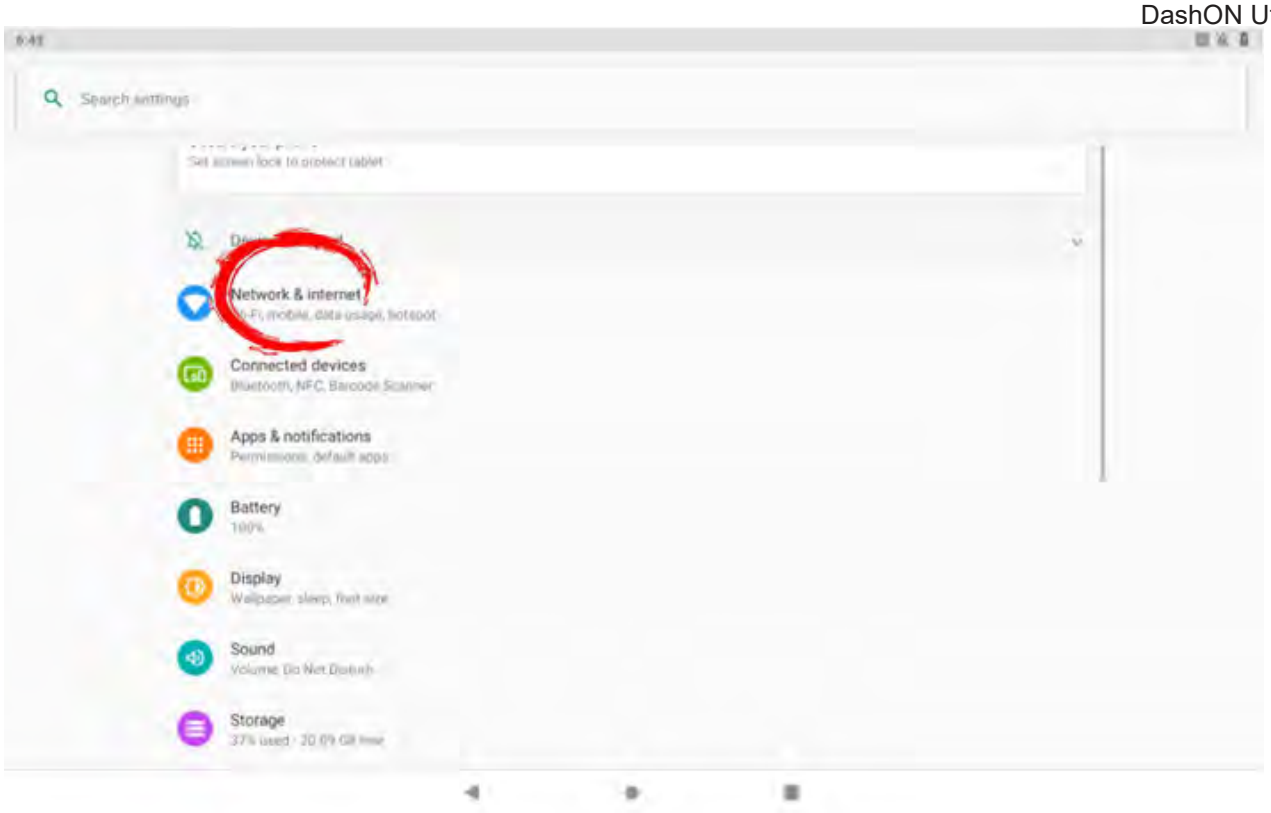


Setting the Network, Internet and connected devices

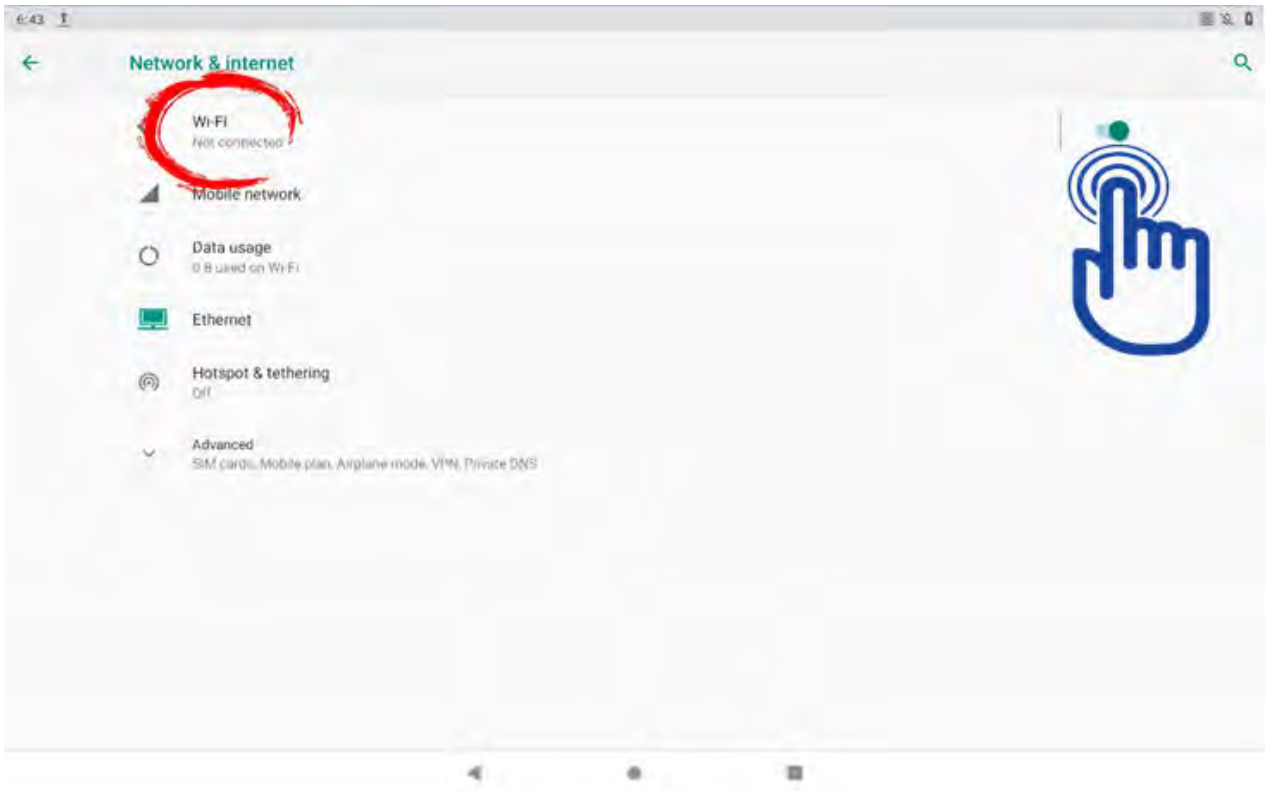
Check the Network & Internet

Tap “Settings” and select “Network & Internet”

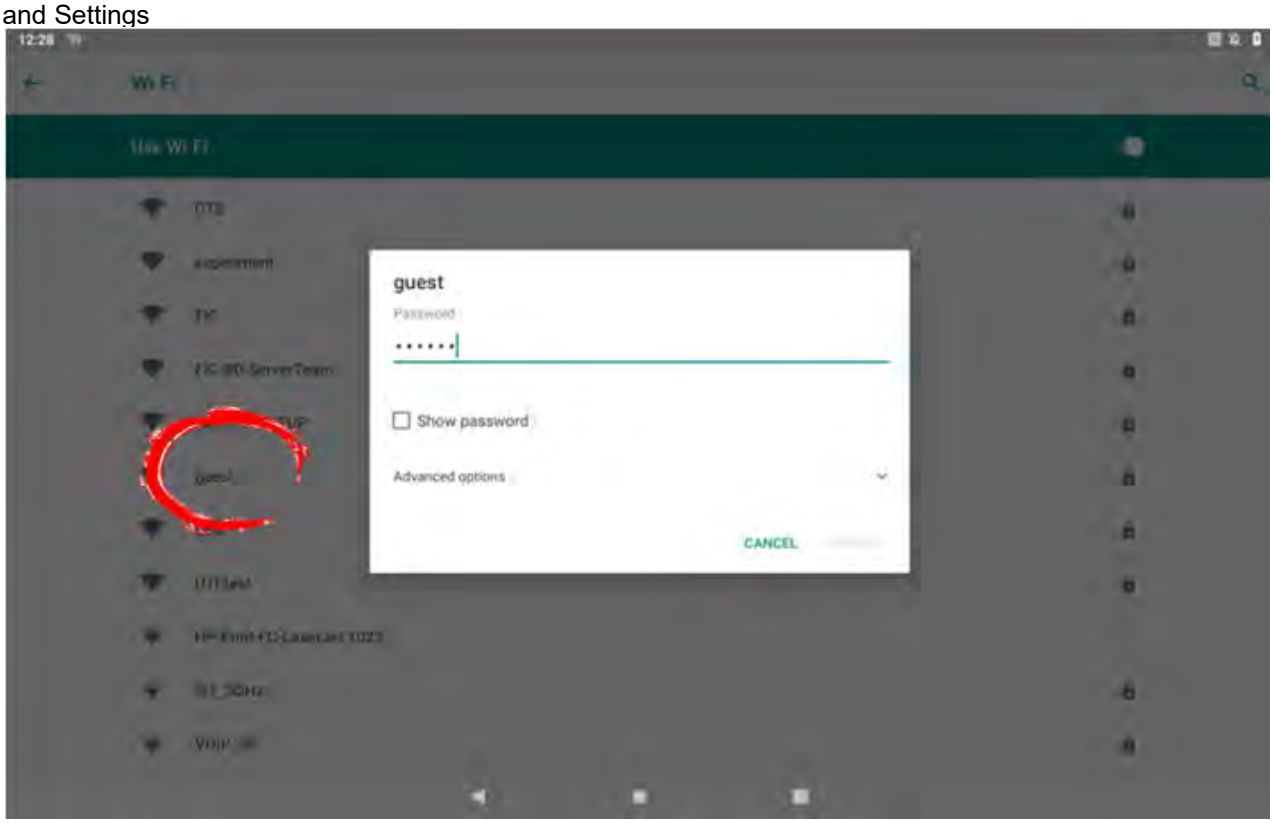
While entry “Network & Internet”, can tap Advanced to do more settings



1) Turn on and select “Wi-Fi”



Select the name of your network and Key in your password

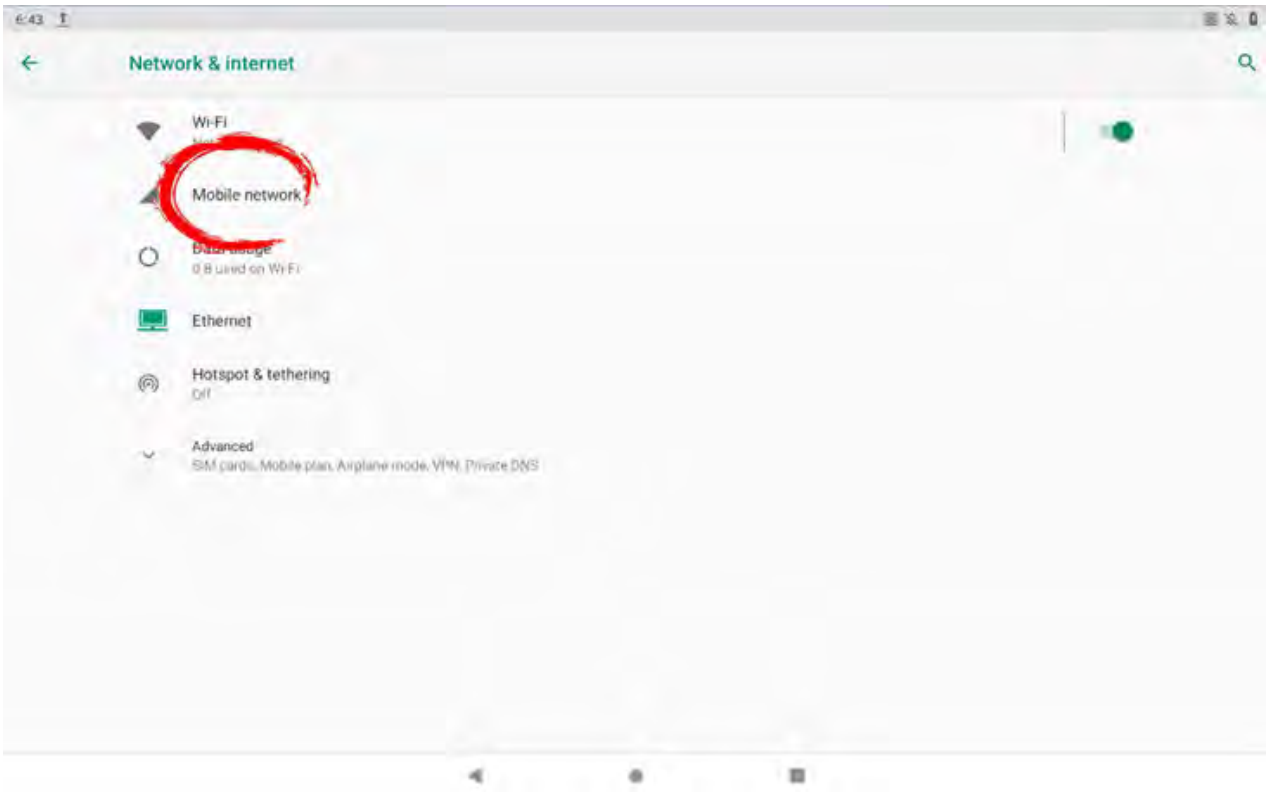


2) Select “Mobile network” to check Networking settings

Make sure the SIM#1 card or SIM#2 card to be plugged in

Hot-swappable SIM #1 card design

Support Dual SIM Dual Standby (DSDS) for Data only

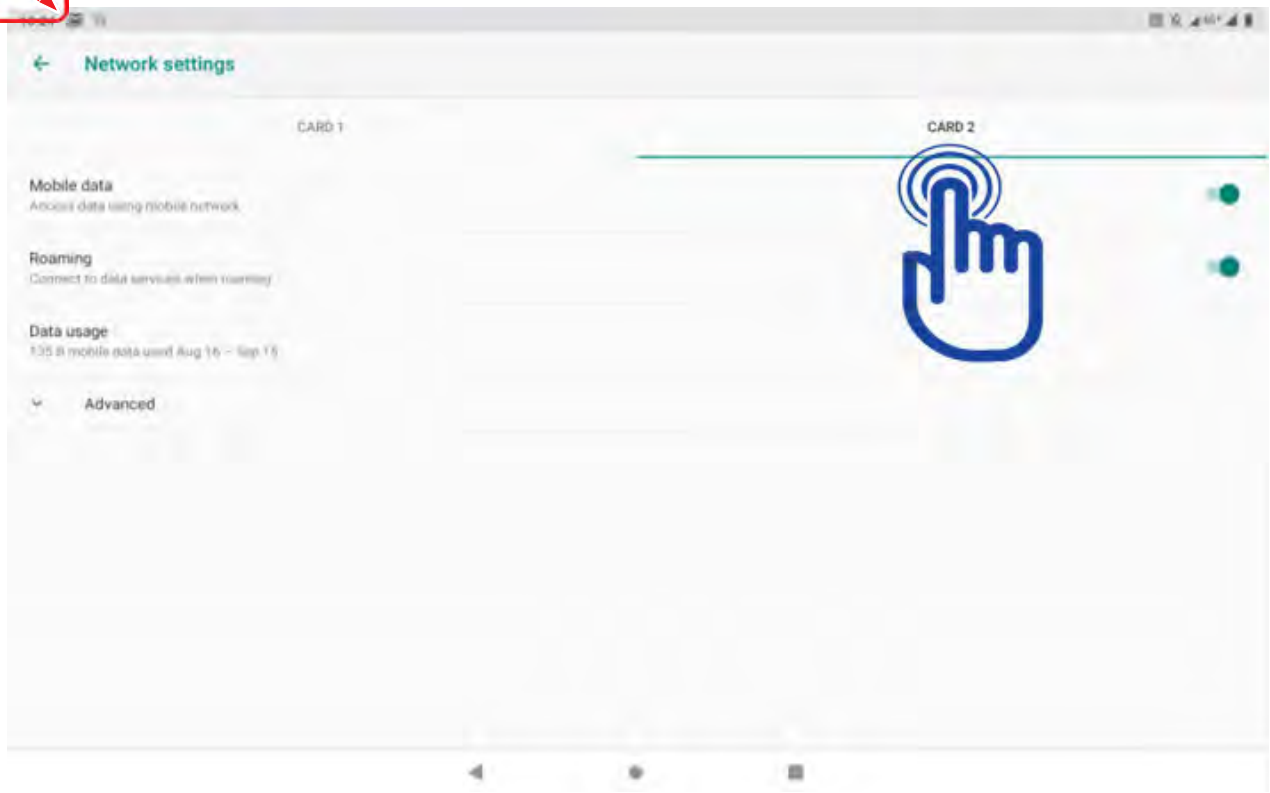


Shows SIM#1 card information

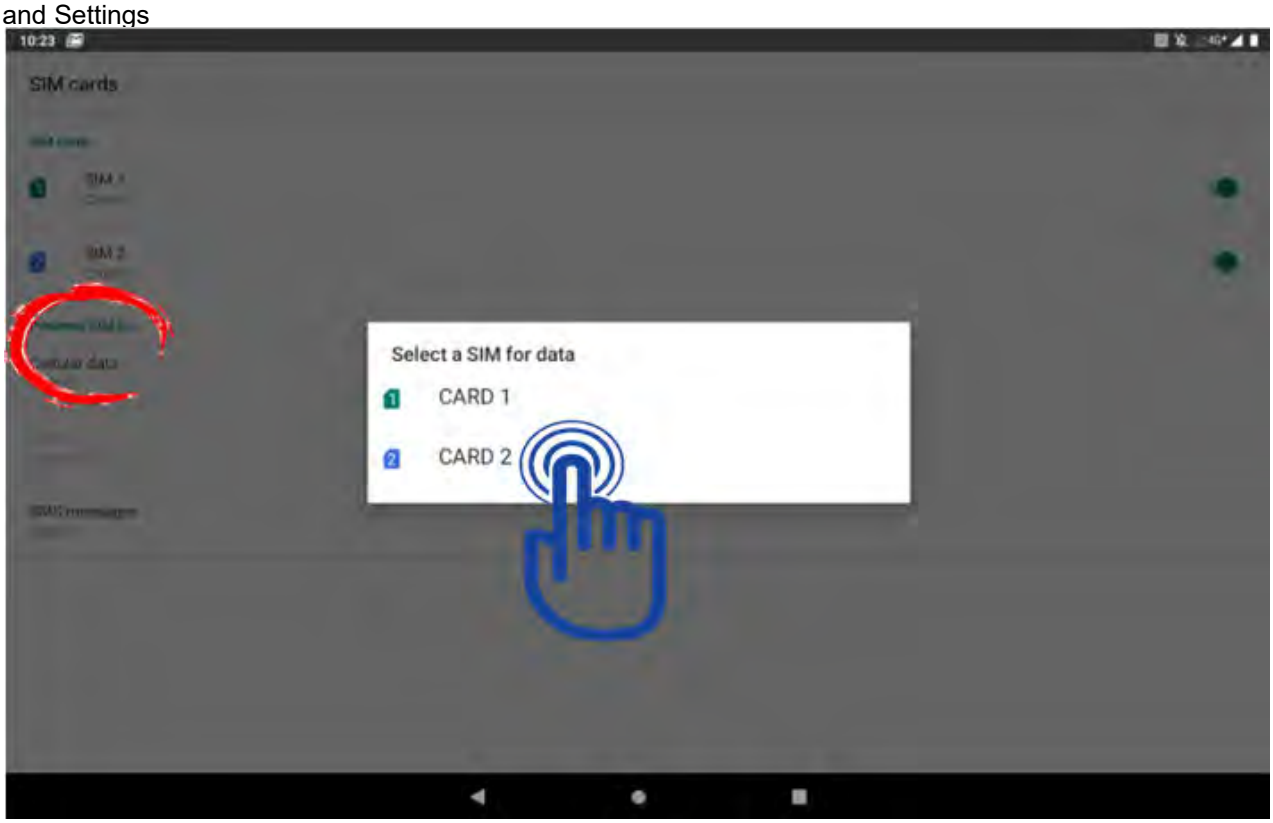
Can tap Advanced to see more information

Tap “card 2” to show SIM#2 card information

Can tap Advanced to see more information

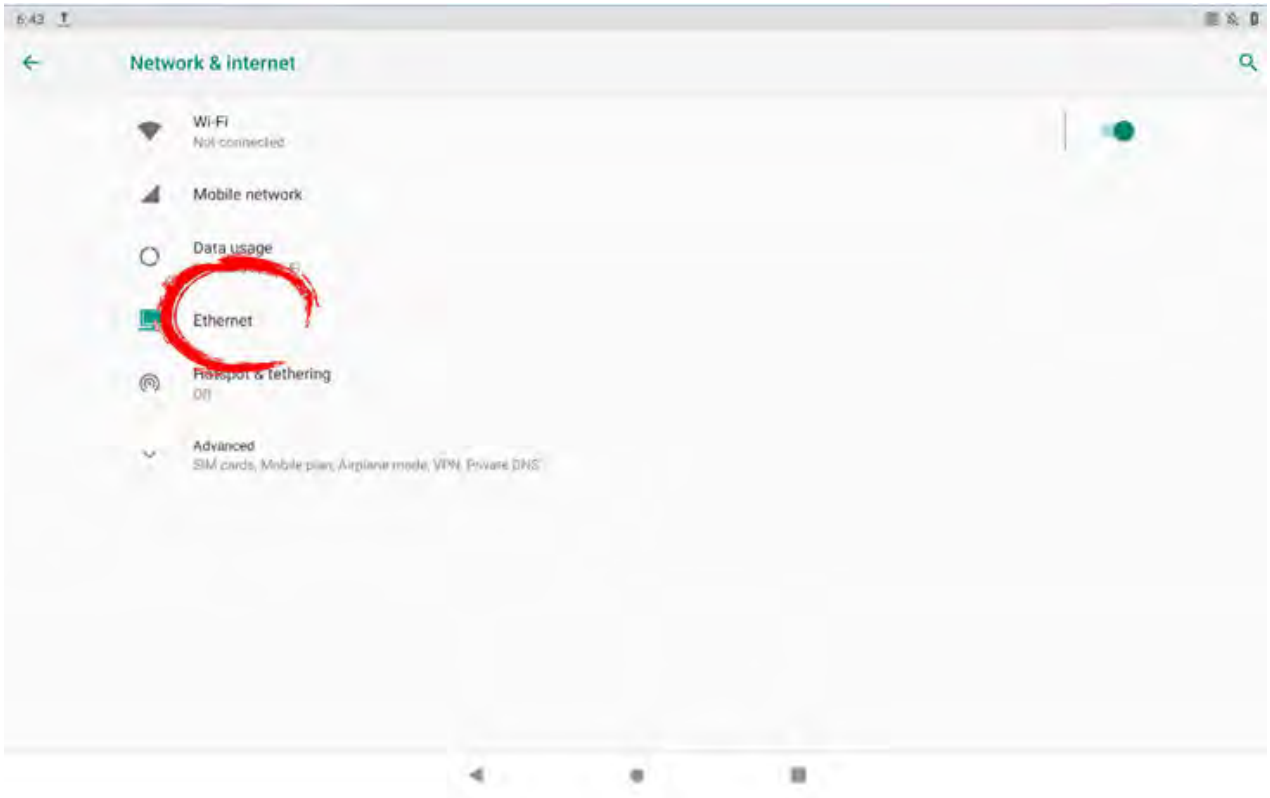


Go back to the “Mobile network” and select “SIM cards” to decide which carrier you prefer



3) Select “Ethernet” to check Ethernet settings

Make sure RJ45 cable is plugged in

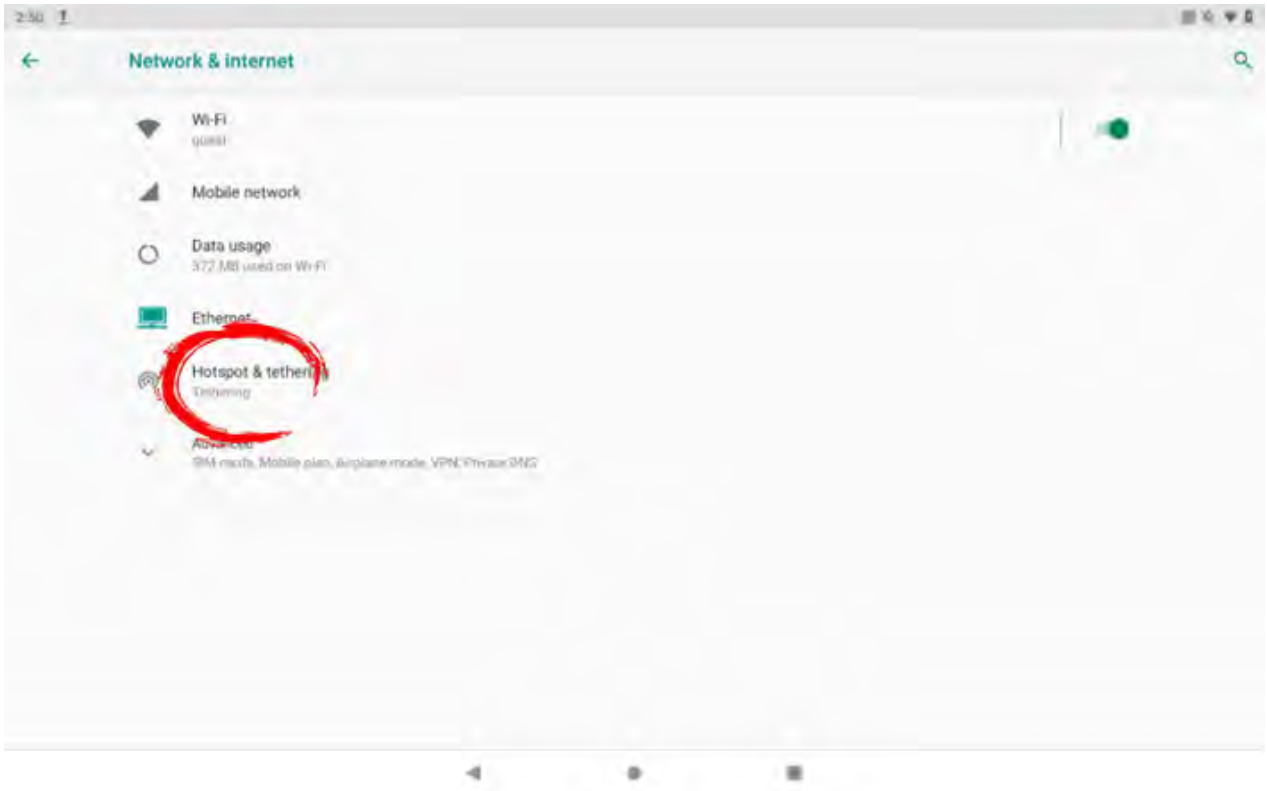


Turn on “Ethernet” to check Ethernet settings

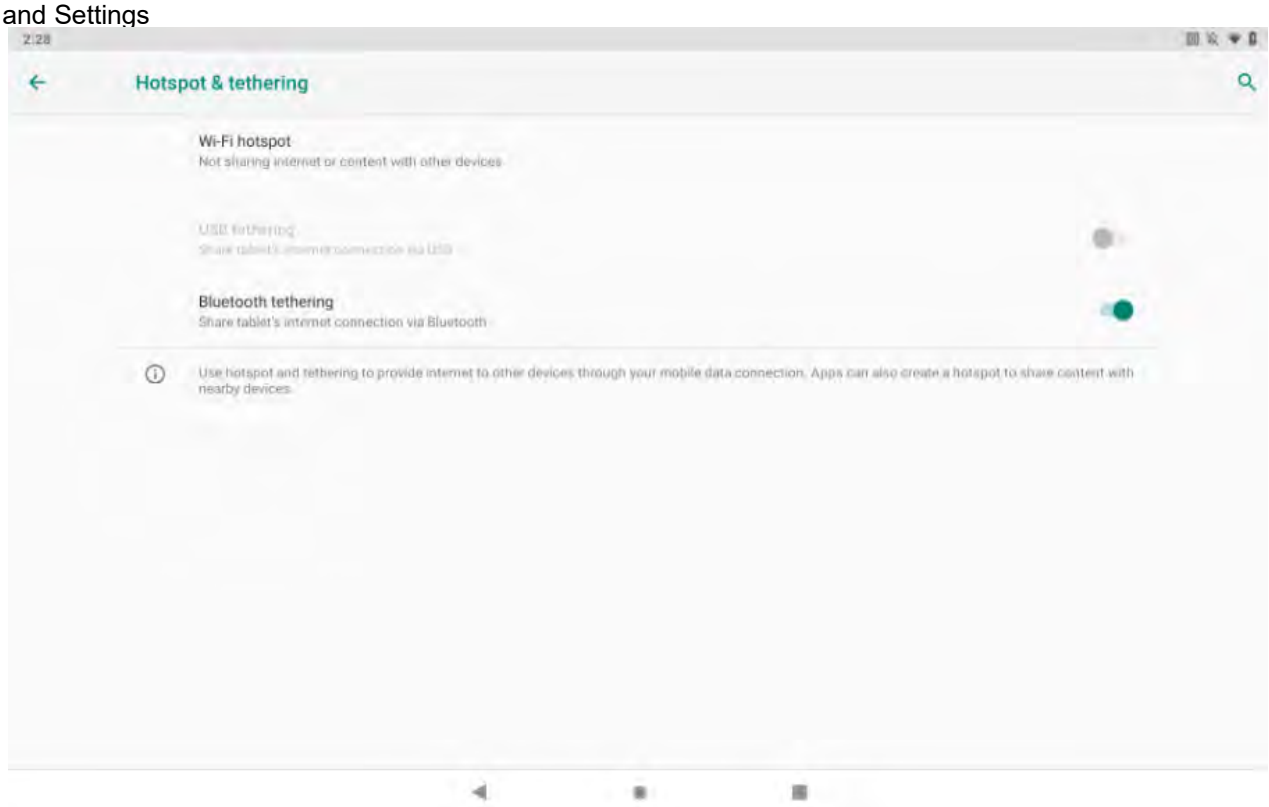
Hotspot & tethering

Select “Hotspot & tethering” to configure the device settings

Wi-Fi hotspot only supports 2.4GHz

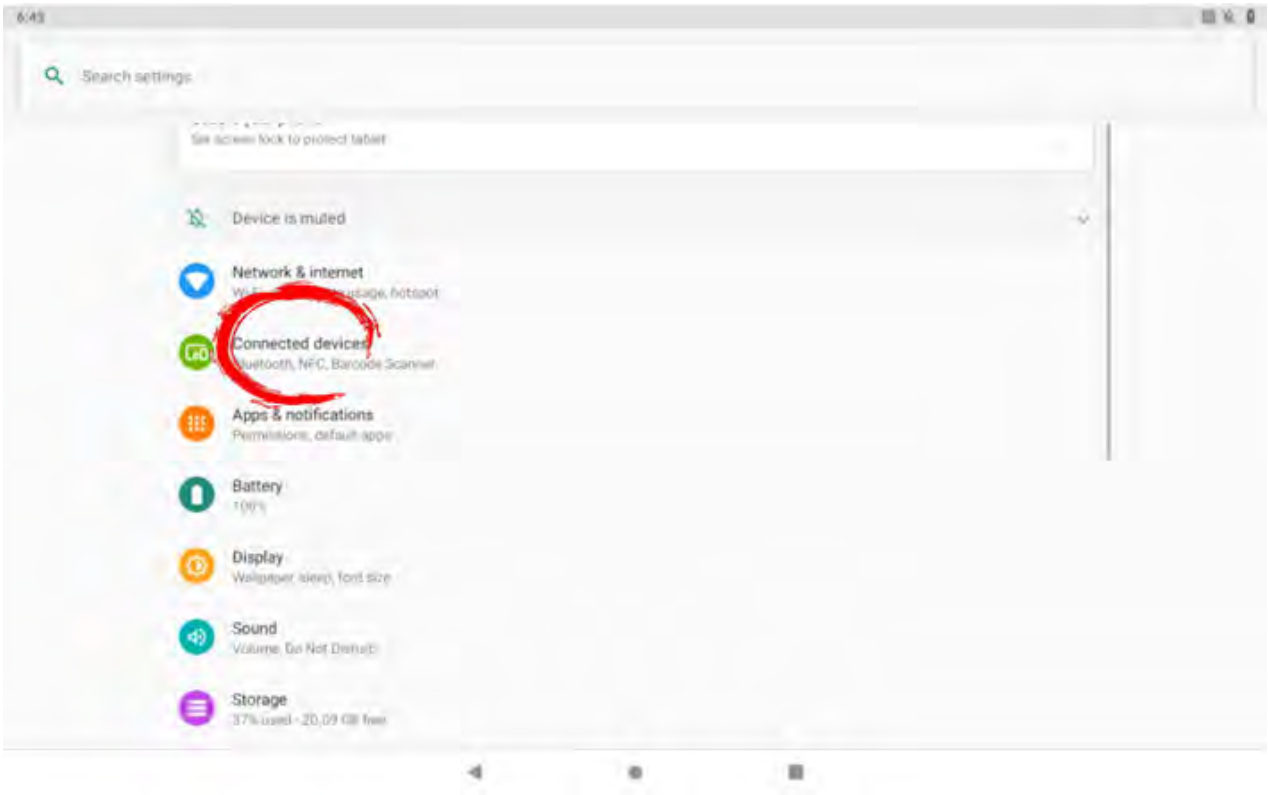


Connection of a mobile device with other devices can be done over wireless LAN (Wi-Fi), over Bluetooth or by USB



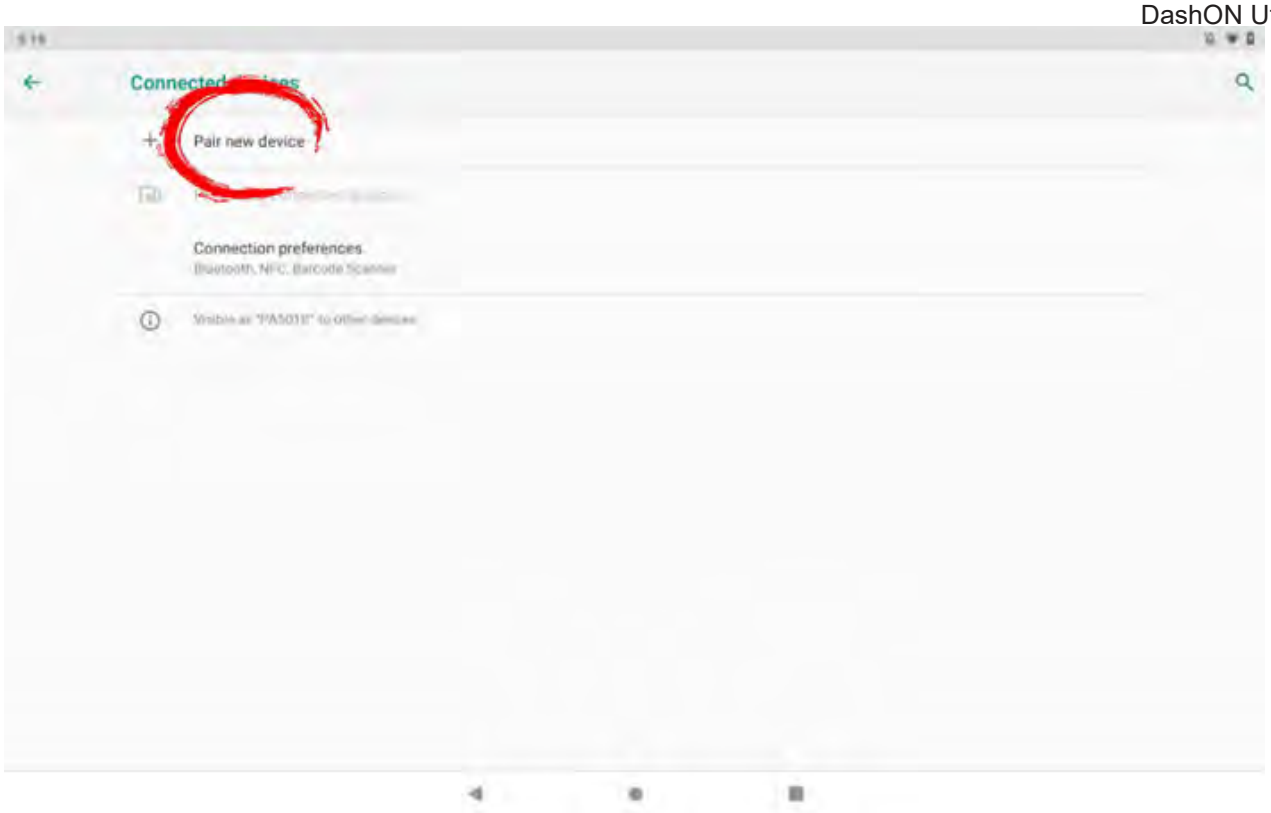
Connected devices

Select “Connected devices” to configure the device settings

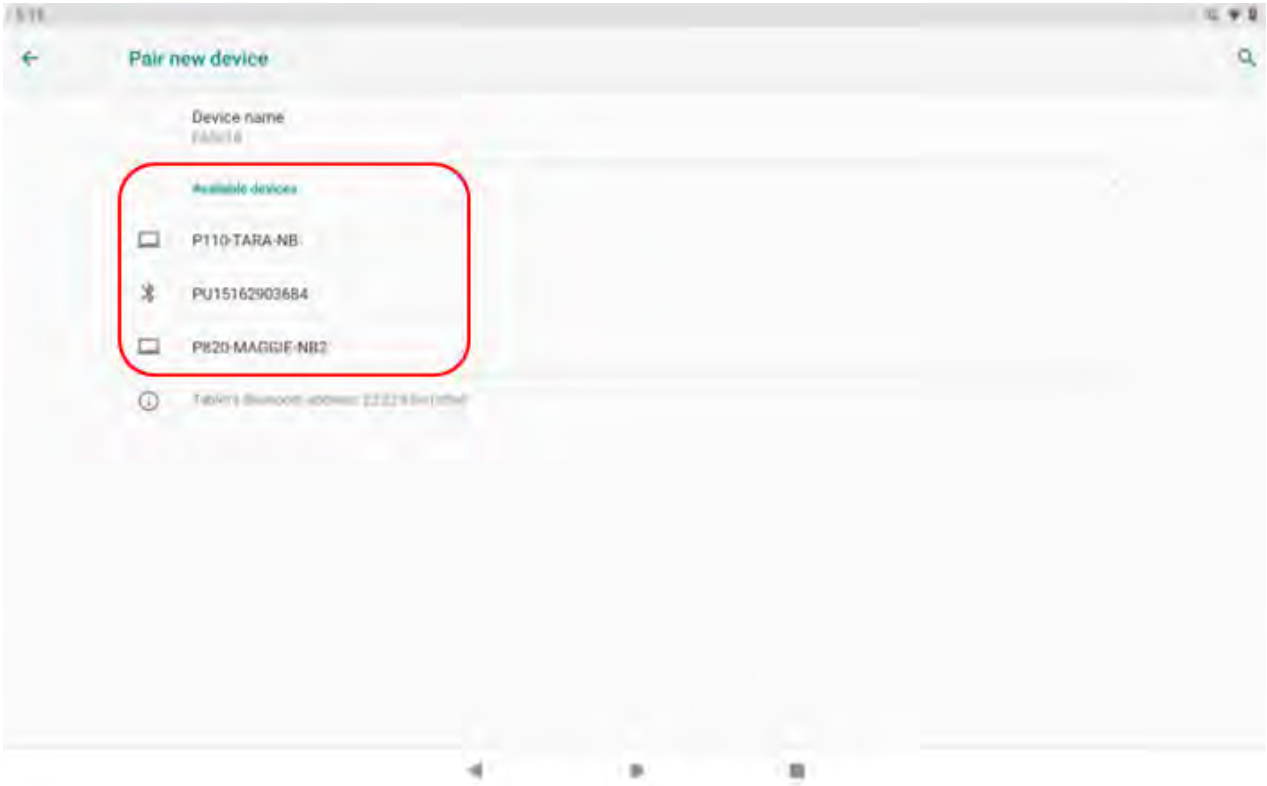


Select “Pair” new device” to search the device

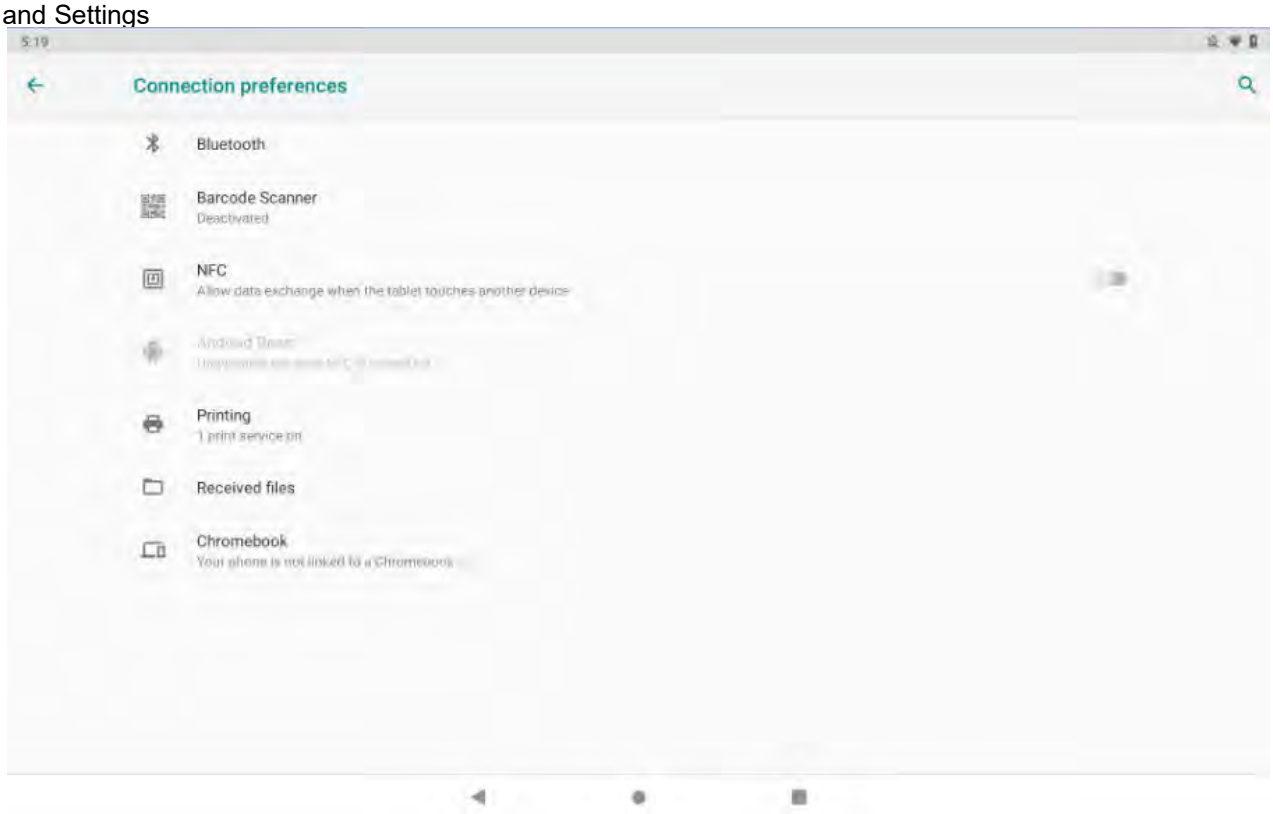
Should turn on wireless function



Choose one of the available device names

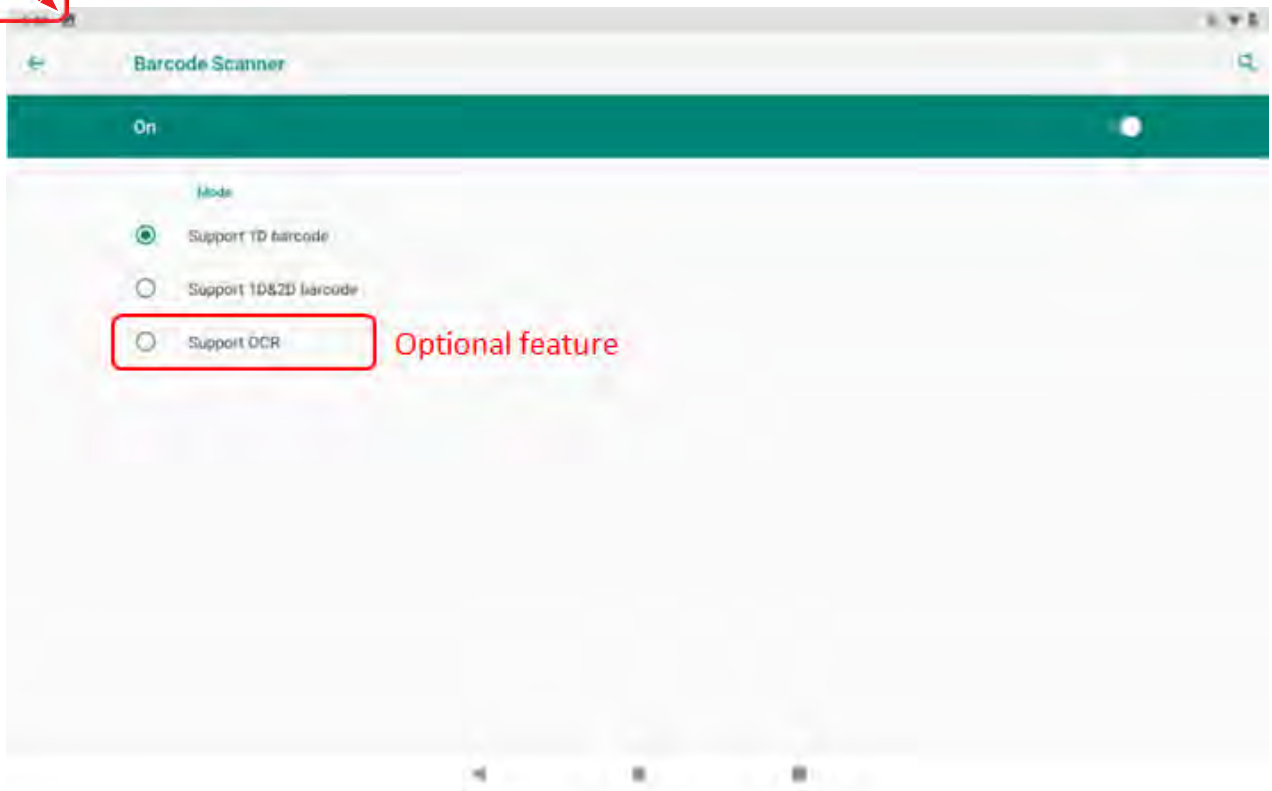


Select “Connection preferences” to choose which devices you prefer to connect, like Bluetooth, Barcode scanner or NFC…etc.



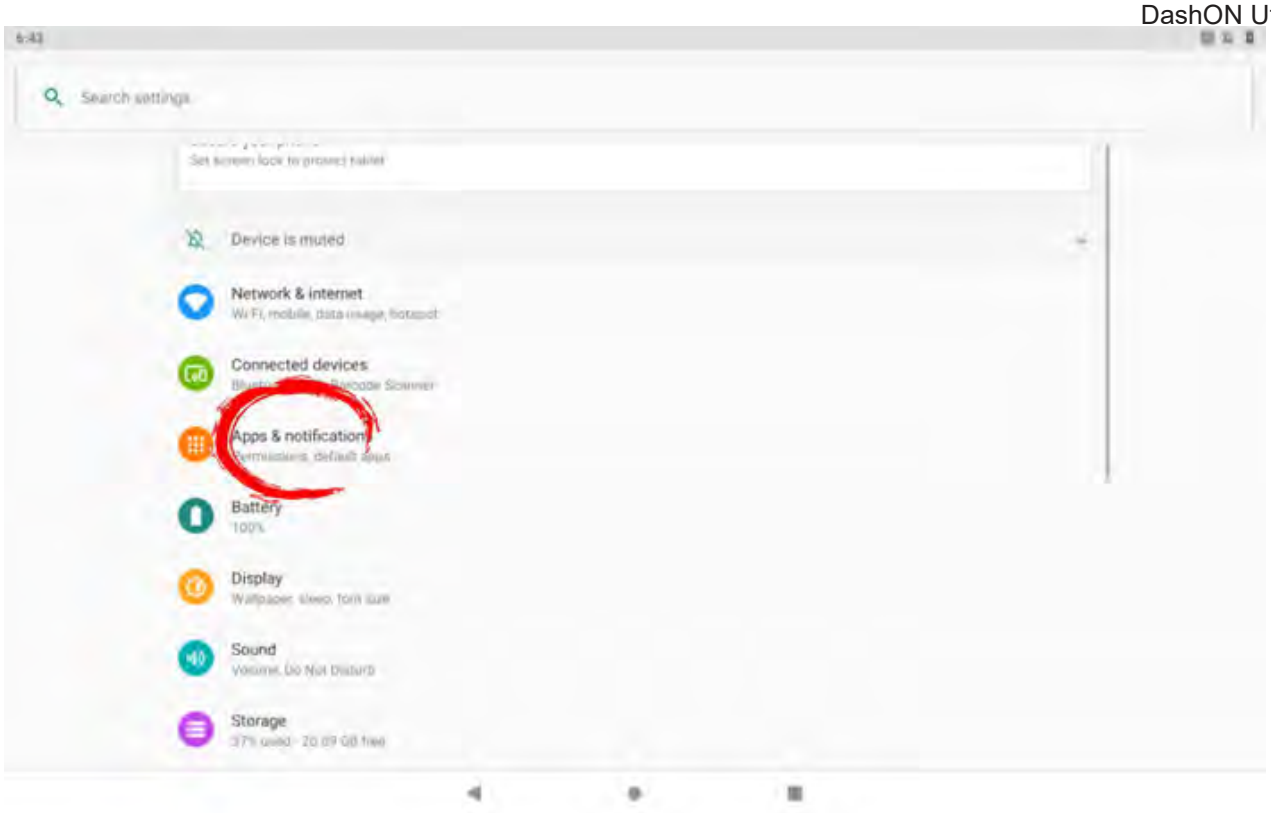
When 2D barcode is integrated in the system, and after turned on the function, there are three modes can be selected

OCR is an optional feature



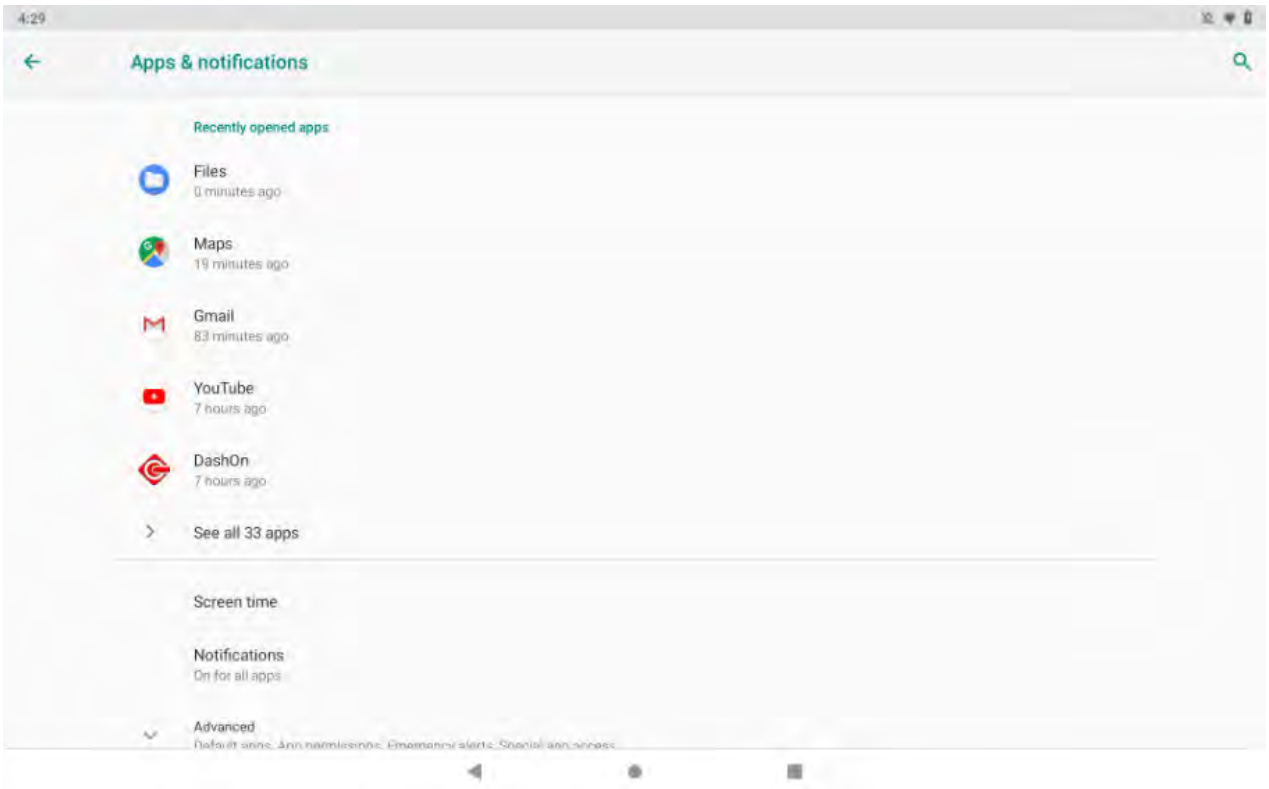
Apps & notifications

Select “Apps & notifications” to configure Apps settings



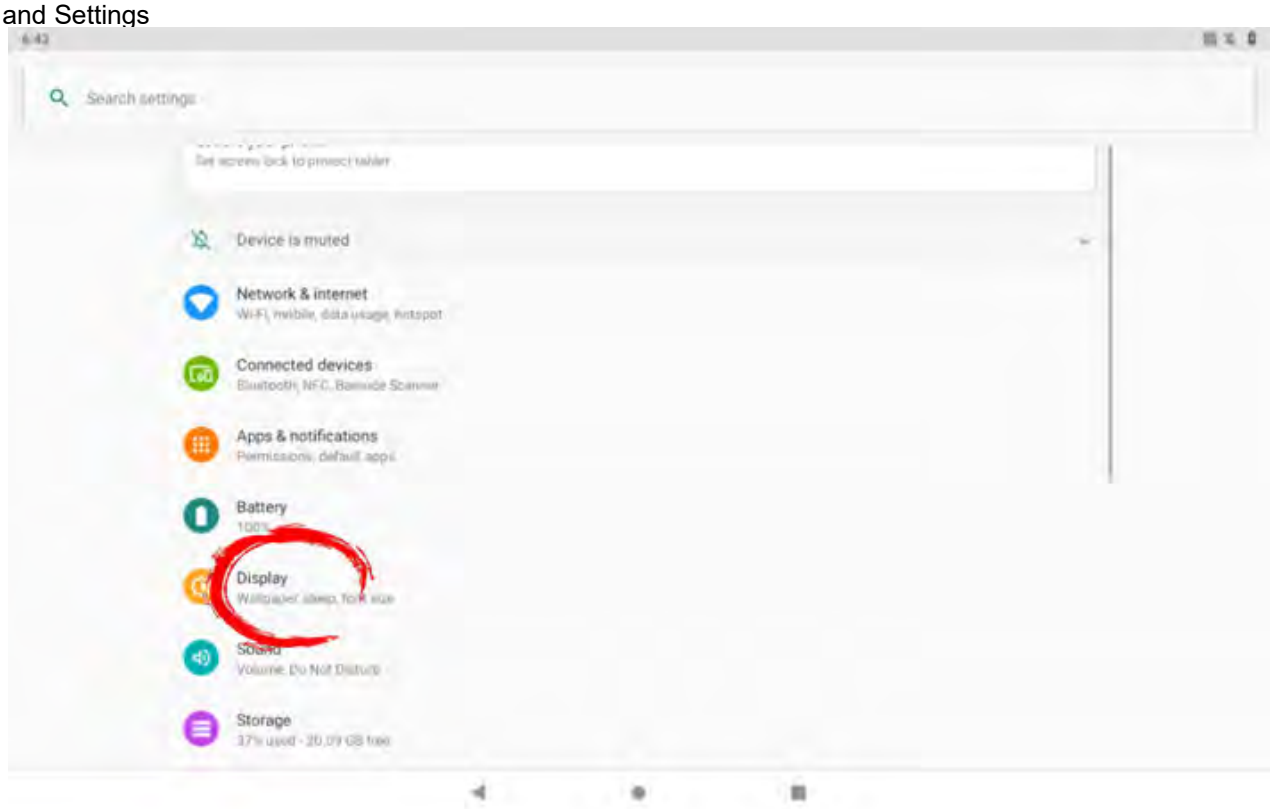
View all apps and can set “Disable” or “Force stop” of them

Can tap Advanced to do more settings



Display

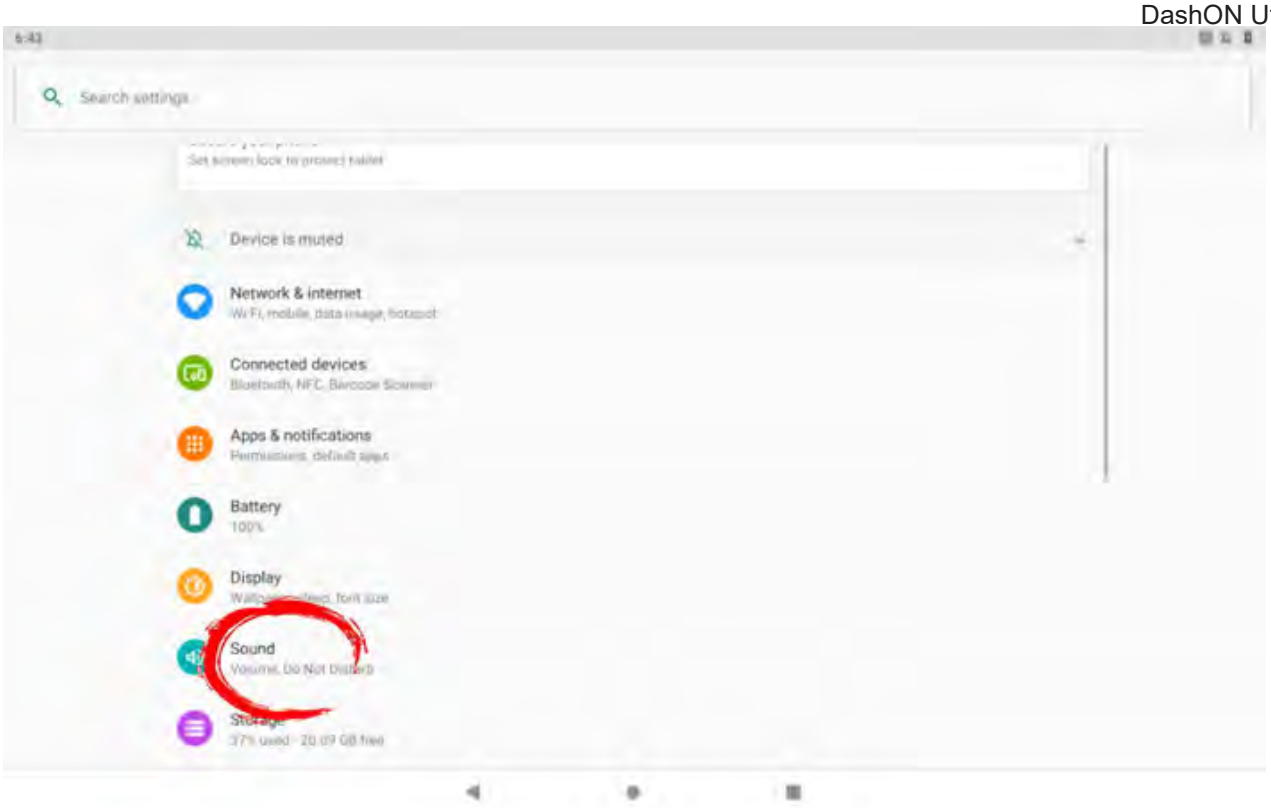
Select “Display” to configure display settings



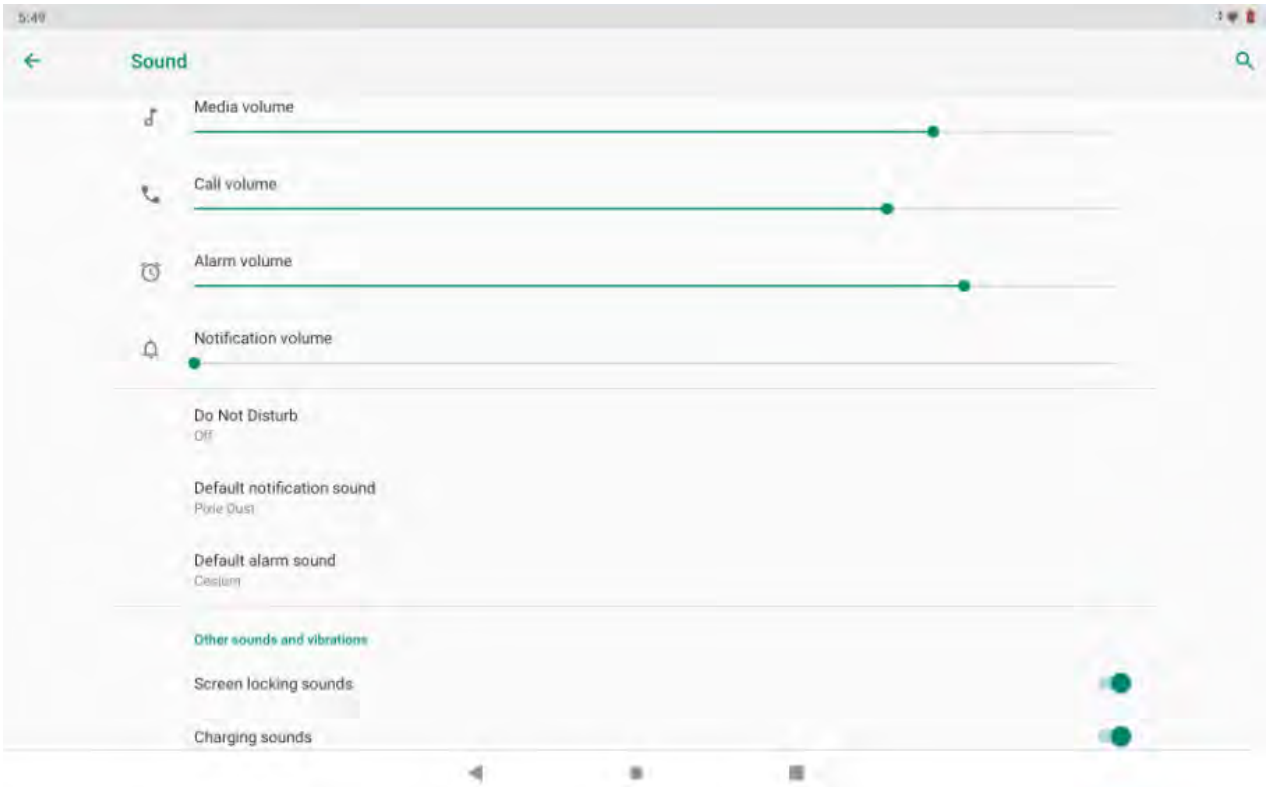
Can adjust the configuration of Night light, Brightness, Wallpaper, Sleep mode, Auto-rotate, Font size, Display size...etc.

Sound

Select “Sound” to configure volume settings for audio broadcasts



Can set the configuration of Media volume, Call volume, Alarm volume, Notification volume...etc.



Chapter 5. RuggON DashON Utility

Overview

The DashON resident program is designed to provide near-instant access to your device's settings and configuration within a single, easy to use interface.

The following information illustrates and describes the various settings available for configuration through the DashON menus.

Important: Do not terminate or remove the DashON program manually or the ambient light sensor and the function buttons will be malfunction.

Available functions are dependent on tablet model and operating system.

DashON Overview

Function	Description
EXIT	Minimize DashON and return to the desktop.
Info Viewer	View system specifications. The menu is for display only.
Battery	Shows the battery level or charging status.
SOH(External Battery)	Shows the Health of external battery.
SOH(Backup Battery)	Shows the Health of backup battery.
Button Setting	Pre-defined functions settings. Supports function button customizing.
Touch Setting	Choose touch mode of finger, glove or stylus

Function	Description

Button Lock	Lock or unlock all the physical buttons except Power button.
Touch Screen Lock	Lock or unlock the touch screen.
Ignition Monitor	Select turn-off time in seconds on vehicle docking
Pass-through Switch	Switch the usage of internal antenna or external antenna on vehicle docking

Info Viewer

The Info Viewer displays the system's hardware specifications.

Tap to display system information. The setting is for display purposes only

Info Viewer

Battery

Shows the battery level or charging status. The icon depends on your tablet.

SOH(External Battery)

Shows health status of the external battery. The icon depends on your tablet.

SOH(Backup Battery)

Shows health status of the backup battery. The icon depends on your tablet.

Battery & SOH

Button Setting

The physical function buttons are configured with pre-defined commands. However, the buttons can be configured to open any number of executable commands. In combination with the Fn key, the function buttons can trigger more commands.

Fn key depends on your tablet.

Barcode trigger button is not allowed for programming if 2D barcode reader is installed.

Button Setting

Select the function key to define and tap the drop-down menu to choose from a pre-defined list of commands.

Alternatively, tap **Other** to select a specific executable file to attach to the function key.

Additional shortcuts can be created by enabling the Fn + button. This allows the creation of a second set of short cuts available by pressing Fn + Function Button.

Tap **Default** to restore each programmable button to the factory settings

Button Setting Menu

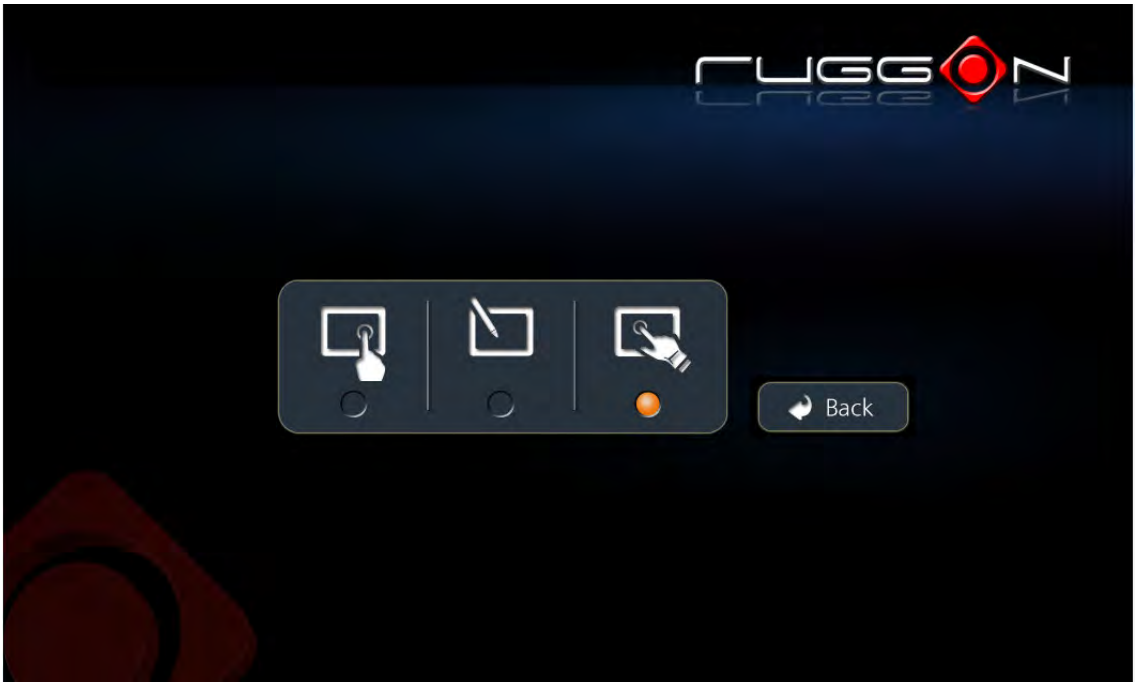
Name an App and save it to a designated file.

Touch Setting

Select a desired mode to begin operation

Touch Setting

Provide finger mode, glove mode and Stylus mode to be selected



Touch Setting Menu

Button Lock

The Button Lock function disables or enables the use of the physical buttons except Power button. Tap to enable or disable the function.

Button lock

Touch Lock

The Touch Lock function disables the touch functionality on the screen. Tap to enable the function.

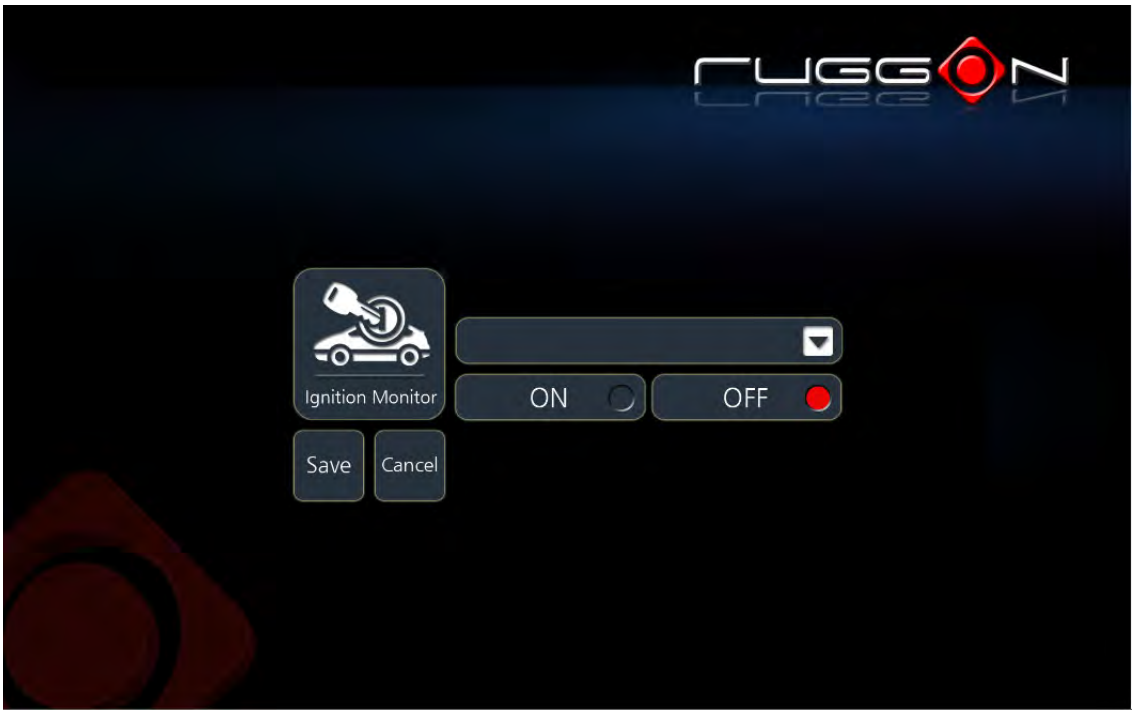
Button lock

Ignition Monitor

Ignition Monitor only works after the device is connected to RuggON Vehicle Dock(VD06)

Ignition Monitor

Select turn-on or turn-off time in seconds



Ignition Monitor

Pass-through Switch

This function is only available on the models with pass-through connector. This function is only available when tablet is well connected to vehicle docking (VD06, VD10), GPS, WWAN and Wi-Fi settings are available once the optional RF antenna is connected.

Passthrough Switch

The external antenna can be selected two from WWAN, Wi-Fi or GPS.

Pass-through Switch Menu

Ext. 1: Wi-Fi and GPS are exclude.
Ext. 2: Wi-Fi and WWAN are exclude.
Ext. 1 Wi-Fi and Ext. 2 Wi-Fi are exclude.

The system may display an error when an incompatible external GPS antenna is detected or setup is not completed after selecting GPS on Ext. 1.

Possible solutions for this issue are as follows:
Tap OK: The system reverts to the use of the built-in GPS antenna
At this time do not tap OK. See a possible solution as follows

Remove and re-connect the external antenna. If a connection is established, the error no longer displays.

Remove the current external GPS antenna and replace it with a different one. If a connection is established, the error no longer displays. The original GPS antenna may not be compatible or is malfunctioning

GPS Failed

Display status delay is normal when detecting an external GPS antenna.

Chapter 6. Troubleshooting

Use the troubleshooting tables in this section to fix problems with the Wi-Fi connection, 802.1x security, or general problems with operating the computer.

If you send the computer in for service, it is your responsibility to save the computer data and configuration. RuggON is responsible only for ensuring that the hardware matches the original configuration when repairing or replacing the computer.

Troubleshoot the Wi-Fi Connection

Use this troubleshooting table to help solve problems with your 802.11 radio connection.

Q. When you turn on the computer after it was suspended for a while (10 to 15 minutes or longer), it can no longer send or receive messages over the network.

A. Host may have deactivated or lost current terminal emulation session. In a TCP/IP direct connect network, turn off the “Keep Alive” message from host to maintain the TCP session while the computer is suspended.

Q. The computer is connected to the network and you move to a new site to collect data. Your computer now shows you are not connected to the network.

A. Move closer to an access point or to a different location to reestablish communications until you reconnect with the network.

Q. The computer appears to be connected to the network, but you cannot establish a terminal emulation session with the host computer.

A. There may be a problem with the host computer, or with the connection between the access point and the host computer. Check with the network administrator to make sure the host is running and allowing users to log in to the system.

Q. The computer appears to be connected to the network, but the host computer is not receiving any information from the computer.

A. There may be a problem with the connection between the access point and the host computer. Check with the network administrator or use your access point user’s manual.

Q. A network connection icon appears in the toolbar, but then disappears.

A. The computer may not be communicating with the intended access point. Make sure the network name matches the access point network name.
The access point may not be communicating with the server. Ensure the access point is turned on, properly configured, and has 802.1x security enabled.

Troubleshoot Operating the Computer

Use this section to troubleshoot problems that may prevent you from being able to operate the computer.

Q. You press the Power button and nothing happens.

A. Make sure that power is connected to the computer.

Q. The computer appears to be locked up and you cannot enter data.

A. Restart the computer.

Call Product Support

Simple instructions please contact the dealer, contact ruggon representative, or leave a message visit the RuggON website at www.ruggon.com.

To better assist you have the following information ready:

- Configuration number
- Serial number
- Operating system, and MCU versions
- Service pack version
- System component versions
- If you are using security, know the type and the full set of parameters

Chapter 7. Maintenance

Cleaning the Device

Danger to electric shock when cleaning or maintaining the PA501.

To avoid electric shock, turn the PA501 off and disconnect it from the power supply before cleaning or maintaining it.

Housing

- The housing of the PA501 is best cleaned with a damp cloth.
- Use compressed air, a high-pressure cleaner or vacuum cleaner may damage the surface.
- Use a high-pressure cleaner, the additional risk of water entering the PA501 may damage the electronics or touch screen.

Touch Screen

- Use neutral detergent or isopropyl alcohol on a clean soft cloth to clean the panel surface.
- Prevent using any kind of chemical solvent, acidic or alkali solution.

Returning the Device

Please put the contents in the original package gently when you need to return the PA501.

Contacting RuggON

If you experience technical difficulties, please consult your distributor or contact the technical services department:

www.ruggon.com

RUGGPAD